the ILLINOIS ENGINEER

STATE CAPITOL, Springfield—Governor Otto Kerner
72nd Illinois General Assembly Began Work This Month

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THE
ILLINOIS ENGINEER
ILLINOIS SOCIETY OF PROFESSIONAL ENGINEERS, Incorporated
Affiliated with the National Society of Professional Engineers
PROGRESS TOMORROW THROUGH BETTER ENGINEERING TODAY

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PROGRESS TOMORROW THROUGH BETTER ENGINEERING TODAY!

THE PATH TO PROFESSIONAL PROGRESS

The strength of a volunteer organization, such as ISPE, is measured by the number of its dues paying members. The vitality of the society is measured by the level of individual member participation. 1961 will provide opportunities to increase both the strength and vitality of ISPE.

For the first time in ISPE history the 1961 budget has available and budgeted financial support for committee work. The amount budget equals $7200 (or approx. $2 per member) and is in keeping with the stated purpose of the last dues increase. The expenditure of these funds will certainly contribute to continued professional progress.

John Housiaux,
Secretary

The mark of progress which this improved operating condition represents gives rise to a need for aggressive and prudent leadership at the state committee level. This mark of progress emphasizes the continuing need for a well-defined organization and, perhaps most important of all, a wider understanding of the philosophy of professionalism. For it is from a proper combination of these elements: professional knowledge, a strong organization, enthusiastic leadership, and reasonable financial support that the pace of progress will be maintained.

It should be recognized that the purpose of a strong organization with well-defined procedures is not to stifle individual initiative and growth but rather to give it a sense of direction. A sense of direction is increased to the extent each individual works as a part of the organization—from within. One of the fundamental purposes of the professional society is to provide encouragement and opportunities for self-development.

Progress is never the product of pessimism. We as engineers justifiably have cause for a noble discon-

THE NSPE'S ACTIVITIES RELATING TO ENGINEERING TECHNICIANS

By O. S. Hammer, P.E., *Vice President and Director of Training,* United Electronics Laboratories, Louisville; and member of NSPE Engineering Technicians Committee

A question sometimes asked by members is: "What can the NSPE do for a state society and for its individual members?" Perhaps an explanation of the NSPE's activities as related to technicians will serve to answer this question in a specific manner and will serve also to apprise the membership of the NSPE's activities in this particular field.

Practically all national organizations and societies operate through committees, and this is particularly true of the NSPE. Thus, the first action which occurred in this matter was at the 1958 Winter meeting when the following motion was recorded: "Moved that the Board direct the president to appoint a committee to concern itself with the relationship of the technician with the professional engineer; correspondingly, the relationship of the technician with the professional engineering society; and of the Society with respect to technicians." The Committee was appointed and has moved forward with great strides to accomplish the objectives laid out for it, under the chairmanship of Arch E. Friel, P. E., of the Dow Chemical Company. The Committee members who were appointed represent a wide range of viewpoints on the assigned objective. In addition to Mr. Friel and myself, there were Jack T. Ludwig, P. E., formerly with Minneapolis-Honeywell and now with Electronic Communications, Inc., in Florida; Karl O. Werwath, P. E., President of the Milwaukee School of Engineering;

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and Dr. Merritt A. Williamson, P. E., Dean of the College of Engineering and Architecture, Pennsylvania State University. Francis H. Berleth, P. E., of the Hughes Tool Company of Texas, recently has been appointed to the Committee to fill the vacancy created by the resignation of Mr. Ludwig in June, 1960.

In its two and one-half year existence, the Engineering Technicians Committee (ETC) has held numerous meetings, has carried on voluminous correspondence between Committee members, and has made seven reports to the NSPE Board of Directors.

Several basic questions presented themselves to the ETC. Among these were: (a) *Just what is a technician?* (b) *Since the NSPE is a professional engineering society, why is it justified in even considering any action relative to technicians?* (c) *If the NSPE should concern itself with technicians, what should be the extent of its concern?* and (d) *If it were decided that the NSPE should concern itself with technicians, how should this program be handled?*

In searching for the answers to these questions, the ETC decided that the rapid advances of technology require a broader view of the engineering profession than perhaps each of us, individually, is accustomed to. The "engineering team" approach seemed to be most suitable, as the engineer seldom works alone in the modern technological field. This engineering team consists of people with various degrees of skill, training, and knowledge, ranging from the mechanic through the technician to the engineer and scientist. From this concept there is little doubt that the technician plays a very important role on the engineering team. In fact, today's technicians are performing many of the tasks which ten or perhaps even five years ago were being performed by the engineer. This has come about because of the expanded technical knowledge and the fact that the engineers have thereby "moved up the ladder," their former positions being filled by technicians. All existing trends seem to indicate that the role of the technician on this engineering team will become increasingly important as the technological field continues its phenomenal expansion. Thus, it is evident that the NSPE, which is devoted to serving the **engineering profession**, should concern itself with the technicians. This provided the answer to question (b).

The matter of just what a technician is and what he does led to much discussion. The Committee met with experts from industry, education, and various technical societies, so that as broad an over-all view of the technician as possible was obtained. After much deliberation, the ECPD definition of an engineering technician was adopted:

"An engineering technician is one who can carry out, in a responsible manner, either proven techniques

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APPROVE "MOONLIGHTING RULES" FOR MINNESOTA FACULTY CONSULTANTS

Faculty members at the Institute of Technology of the University of Minnesota, who provide Consulting Engineering Services outside their regular teaching duties, can now do so only if they conform to a guide drafted by Institute Dean, A. F. Spilhaus, in cooperation with the Ethical Practices Committee of MACE. It was suggested that the Institute observe the following policies in connection with professor-consultants:

1. All requests for consulting work by members of the faculty are referred by the Dean to the President's office for approval.
2. Faculty members are requested not to use University letterhead for outside Consulting Engineering correspondence.
3. The University charges 5% of the fee obtained by a faculty member for any equipment or facilities owned by the University and used in conjunction with Consulting Engineering.
4. In general, the faculty is encouraged to do the kind of outside work which is in line with their speciality.
5. The University, only, shall do testing work of a type that requires special equipment that is not available in the area. Any requests for testing of any kind that can be done by laboratories should be referred to local laboratories.
6. The amount of work which faculty members may take on is governed, in the case of full-time members, so as not to conflict with their contribution as faculty members of the Institute of Technology.

Institute Dean, A. F. Spilhaus, endorsed the proposed policies and authorized their publication for all faculty members performing outside consulting work.

Housiaux

(continued from page 1

tent. Not a hand-wringing discontent of despair, but rather a discontent that recognizes the opportunities and challenges that are available to us and the need for constructive unified action.

A specific goal for ISPE is to increase both its strength and vitality. It is only through full and active participation that individual members can realize the maximum benefits of their ISPE memberships. It is also through this type of participation that maximum benefits to the society accrue.

The goal and need of ISPE is:

GREATER STRENGTH THROUGH
AN INCREASED MEMBERSHIP AND
GREATER VITALITY THROUGH
INCREASED INDIVIDUAL PARTICIPATION

This is the path to professional progress.

THE UNIVERSITY OF ILLINOIS
DIVISION OF UNIVERSITY EXTENSION
ANNOUNCES THE
FOURTH ANNUAL ILLINOIS LAND SURVEYORS CONFERENCE
February 13 and 14, 1961 Urbana, Illinois

and the

COMBINED PHOTOGRAMMETRY - SURVEYING SHORT COURSE
February 14-16, 1961 Urbana, Illinois

Conducted by the Illinois Registered Land Surveyors Association and the Department of Civil Engineering in cooperation with the Division of University Extension.

ANNOUNCEMENT

CONFERENCE PROGRAM OUTLINE

Monday, February 13

8:00- 9:00	Registration—Coffee served
9:00- 9:30	Welcome Addresses
9:30-10:30	The Department of Registration and Education
11:00-12:00	The Role of Attorney General
12:00- 1:00	Luncheon
1:30- 3:00	Professional Standing
3:30- 5:30	Workshop Session on Professional Standing
7:30- 9:00	Annual Business Meeting of the Illinois Registered Land Surveyors Association

Tuesday, February 14

9:00-10:00	Panel on Subdivision Planning and Design
10:30-12:00	Workshop Session on Subdivision Planning and Design
12:00- 1:00	Luncheon
1:30- 2:30	Panel on Legal Problems of Resurveys
3:00- 4:00	Workshop Session on Legal Problems of Resurveys
4:00- 5:00	Plenary Session-Resolutions and Results of Workshop Sessions
6:30-	Annual Banquet

Each Workshop Session will be conducted by dividing those interested into a number of small groups. Each group will be headed by a group leader who will direct the group into drawing up resolutions regarding the topic discussed.

SHORT COURSE PROGRAM OUTLINE

This year's short course will treat the following subjects: Photogrammetry, Photo - Interpretation, Property Surveying and Electronics Computations. The participants may choose between two groups:

Group A: with a principal interest in photogrammetry

Group B: with emphasis on property surveying.

Tuesday, February 14

9:00-10:00	Registration
10:00-10:30	Welcome Address
11:00-12:00	Group A: Photogrammetry B: Property Surveying
12:00- 1:00	Luncheon
2:00- 5:00	Group A: Photogrammetry B: Property Surveying
6:30-	Annual Banquet

Wednesday, February 15

9:00-12:00	Group A: Photo-Interpretation B: Elementary Photogrammetry
2:00- 5:00	Group A: Photogrammetry B: Photo-Interpretation
7:30- 9:00	Group B: Property Surveying

Thursday, February 16

9:00-12:00	Groups A and B: Electronic Computations
2:00- 5:00	Groups A and B: Electronic Computations

FEES:

The registration fee for the conference only is $15.00 per person. This fee includes conference materials but does not include cost of food, lodging or scheduled meals.

The registration fee for the short course only is $15.00 per person. This fee includes short course materials but does not include cost of food, lodging or scheduled meals.

Further information on this Conference may be obtained by writing to Supervisor, Engineering Extension, Room 116D, Illini Hall, Champaign, Illinois.

ONE FOR ONE IN SIXTY-ONE!

HAVE YOU ADDED

YOUR MEMBER TO ISPE?

STATE CHAPTER OFFICERS' CONFERENCE FOR FEBRUARY 4, PEORIA, CANCELLED

THREE NEW REGIONAL CONFERENCES SCHEDULED FOR MAY

The ISPE Chapter Officers' Conference, originally scheduled for February 4 in Peoria, has been cancelled. In lieu of this conference, THREE REGIONAL CHAPTER OFFICERS' CONFERENCES ARE BEING SCHEDULED FOR THE MONTH OF MAY. These conferences are to be attended by Chapter officers and Chapter Committee Chairmen. Each conference will have a WORKSHOP format.

THE TENTATIVE SCHEDULE FOR THE REGIONAL CHAPTER OFFICERS' CONFERENCES IS AS FOLLOWS:

SATURDAY, MAY 6—SOUTHERN CONFERENCE, CENTRALIA, ILLINOIS

CHAPTERS: MADISON COUNTY, AMBRAW, ST. CLAIR, EGYPTIAN

SATURDAY, MAY 13—CENTRAL CONFERENCE, SPRINGFIELD, ILLINOIS

CHAPTERS: WESTERN, PEORIAREA, BLOOMINGTON AREA, CHAMPAIGN, CAPITAL, CENTRAL ILLINOIS

SATURDAY, MAY 20—NORTHERN CONFERENCE, ROCKFORD, ILLINOIS

CHAPTERS: ROCKFORD, LAKE COUNTY, ROCK RIVER, DuKANE, WEST CENTRAL, ILLINOIS VALLEY, JOLIET, CHICAGO, SALT CREEK, SAUK TRAIL, NORTH SHORE, NORTHWEST SUBURBAN

BUILDING ENGINEERING CONSULTANTS MEET

On Saturday, December 3rd, the third organizational meeting of the new Functional Section for Building Engineering Consultants was held at Peoria.

A discussion by Earl H. Beling, Moline, of the State Fire Code for Schools to be issued in January under Sec. No. 215 of the School Code was one of the meeting highlights. A report is to be prepared on each existing school by architect or engineer and submitted to the State Superintendent of Public Instruction. A review board will be created to review these reports. Enforcement of the new fire code will be by the County Superintendent. Regulations will be prepared for new buildings under Section No. 227 of the School Code.

The Building Engineering Consultants also voted to send their By-laws to the ISPE Board of Direction for approval, and set their section dues at $10.00 per person per year.

The new Mississippi fee schedule was discussed in detail. It was agreed that the next meeting would also be devoted to fees and services, with the intention of reaching a common agreement and the eventual publication of a booklet somewhat like the Mississippi publication.

The group has also decided to invite manufacturers representatives and others where repeated practice of "free engineering" is reported in order to reach a common understanding.

LEGISLATIVE DINNER COMMITTEE AT WORK

Members of the Legislative Dinner Committee, under the chairmanship of Allen Osterling, are making preparations for this biennial event.

You and your chapter should begin planning now to insure that the legislators in your area are encouraged to attend. A letter has been sent to all members of the General Assembly, setting a tentative date of Tuesday, March 21. See the February **Illinois Engineer** for further details.

NGINEERING PROFESSIONALISM IN INDUSTRY

—One out of four engineers in industry believes that engineers are thought of as second class professionals, but no industrial managers agree with this opinion.

—Sixty-one per cent of the engineers employed in industry think there is considerable mal-utilization of engineers, but only 30 per cent of industrial managers agree.

—More than half the engineers in industry think that higher pay would advance the engineering profession, but only 20 per cent of industrial managers agree.

These are some of the findings reported in a survey ntitled "Engineering Professionalism in Industry" ıade under the sponsorship of the Professional Engiıeers Conference Board for Industry, in cooperation vith the National Society of Professional Engineers.

The survey, the sixth in a series made for the Conerence Board, is now available in booklet form from he National Society, 2029 K Street, N. W., Washingon 6, D. C. The survey was made by Opinion Research Corporation on the basis of extensive "depth" interviews with engineers and managers.

Primary objective of the study was to find out what engineers and engineering managers mean by professionalism, and how they think it can best be advanced. The engineers and managers interviewed all work for large companies that employ many engineers and are located in various parts of the country from the East to the West Coast. Six major industries are represented in the sample: chemicals, electronics, petroleum, rubber, aircraft manufacturing and electrical instruments, and machinery.

The interviews brought out that 90 per cent of the managers questioned stated that they regarded engineers among the employees making the most valuable contribution to the company. Less than half of the engineers felt that they were so regarded by management.

One fourth of the engineers stated that management tries to provide a creative atmosphere, but nearly half of the managers claimed that management tries to provide such an atmosphere. Sixty-eight per cent of the managers indicated they believed management shows genuine respect for engineers; however, only

(continued on next page)

PRELIMINARY ANNOUNCEMENT

1,200 Engineers and Wives Expected To Attend Chicago Engineers' Week Banquet At Fabulous McCormick Place

The week of February 19-25, 1961, has been set side as National Engineers' Week. In the Chicago rea the ISPE has joined forces with the ASCE, ASME, AIEE and AIChE to make 1961 National Engineers' Week an outstanding event.

WHERE: McCormick Place, Lakefront Banquet Hall, 23rd Street and the Outer Drive, Chicago, Illinois.

WHEN: Thursday, February 23, 1961, from 6:00 o 10:00 p.m.

WHAT: Dinner, Awards and Speaker.

WHO: All Chicago area engineers and their wives r husbands.

WHY: To culminate the observance of Chicago Engineers' Week and give the public some idea of the reat number of engineers working for their welfare.

HOW MUCH: $6.00 per person. Cocktails not included.

THE PROGRAM

:00 to 6:45 p.m.—Cocktails and social period.
:45 to 7:00 p.m.—Seating in Lakefront Banquet Hall.
:00 to 7:15 p.m.—Announcements and introductions by the Master of Ceremonies.
:15 to 8:00 p.m.—Dinner — Fruit cocktail, Soup of the day, Chef's salad, Half chicken, Apple pie, Cookies and coffee.
:00 to 8:05 p.m.—**Engineer-of-the-Year Award**
8:05 to 8:10 p.m.—**Professionalism Award**
8:15 to 9:15 p.m.—**"MAN INTO SPACE"**

by

Charles L. Barker, Jr., Deputy Chief
Future Projects Design Branch,
Structures and Mechanics Division
George C. Marshall Space Flight Center
National Aeronautics and Space Administration,
Huntsville, Alabama

Mr. Barker is an aeronautical engineer and will discuss the Saturn Rocket System and the program to get man into space. He will bring a 6-foot model of the Saturn Rocket and show a 15-minute movie as part of the program.

9:15 to 9:45 p.m.—Question period
10:00 p.m.—End of Banquet

(Tear Off Here)

Enclosed is my check for $_____ for _____ tickets at $6.00 each for the Chicago National Engineers' Week Banquet on Thursday, February 23, 1961, at 7:00 p.m. at McCormick Place, 23rd Street and the Outer Drive, Chicago. **Make checks payable** to **Chicago Engineers' Week Committee,** and send to **H. Hasen, 922 Sherwood Drive, LaGrange Park, Illinois.**

Name_____

Address_____

Society_____ Chapter_____

36 per cent of the engineers agreed with this. "Companies should not only re-examine whether they are doing enough, but also whether they are communicating their efforts to engineers. If companies are doing all the things they say they are, many of these programs and policies are not now getting through to engineers."

The survey also found a considerable difference in professional attitudes between engineers in companies which would score high on efforts to encourage and develop high standards of engineering professionalism and engineers in those companies which would not score so high in such an evaluation.

Forty-four per cent of the engineers in the above-mentioned "high scoring" companies stated that management really believes in the professional status of engineers, while only seven per cent of the engineers in the second type of company agreed with this.

Fifty-three per cent of the engineers in the second type of company said that engineers are "sort of a commodity—let go quickly if business is poor," but only seventeen per cent of the engineers surveyed in the "high scoring" companies held this view.

Forty-nine per cent of the engineers in the "high scoring" companies admitted to considerable mal-utilization of engineers, but 82 per cent of the engineers in the second type of company said there was considerable mal-utilization.

Questions asked of engineers and managers indicated the reservations that both groups have as to how well company policies on professionalism are carried out by supervisors. Only one engineer in six, and one manager in five, feels that these policies are carried out "very effectively" at the direct level of supervision. Out-right criticisms regarding this are much more pronounced among engineers and managers in the second type of companies than among those in the "high scoring" companies.

The survey found widespread agreement in the "high scoring" type of companies that unions are incompatible with engineering professionalism. In the second type of companies, interviewers found more sentiment against than for engineering unions, but nowhere near the sentiment against such unions as was found in the "high scoring" companies.

In general, managers agree with engineers on the basic ingredients of professionalism. However, managers put primary emphasis on engineers' technical qualifications. While engineers, consistent with their technical orientation, agree that these elements are essential, they also consider many other things important, including a truly professional atmosphere and recognition of professional status by the company."

The survey concludes that much remains to be done to bring professionalism to a higher level in companies. Even in the "high scoring" companies, only 41 per cent of engineers feel that their professional statu is recognized to a very high degree. The problem more acute in the second type of companies, whe only 15 per cent of engineers feel this way.

In both types of companies, the interviewers foun that much larger proportions of managers than engineers feel that professionalism is highly recog nized. "It is not perhaps too surprising," the authors the report state, "that opinions differ in this wa but it does suggest that companies should re-examin where they actually stand in this matter."

On balance, engineers and managers both nam more things they feel the company should do to buil professionalism than name things the engineers shoul do alone.

The interviews brought out that engineers fee that the main things they can do to advance profes sionalism are in the areas of communications, technica development, and integration with broad company ob jectives. In general, managers agree with engineers o the relative importance of things engineers can do t build professionalism but on none of the ten to ranked items do managers agree that a majority o engineers are actually doing these things.

Engineers and managers agreed that salary pro gression shoud reflect engineers' contributions. Thre fourths of the managers stated that their companie follow such a policy, and less than a third of th engineers said their companies follow such a policy Sixty-five per cent of the managers said their com panies let engineers try for high positions anywher in the organization, but only 29 per cent of the en gineers agreed with this.

From the report: "Engineers, though technicall oriented, also show concern about the hallmarks o professionalism that have to do with recognition— prestige for the profession. And, of course, they wan to be utilized as full professionals (a problem men tioned particularly often by engineers in the secon type of companies, but not mentioned at all by man agers in these companies). Obviously there needs t be a greater meeting of the minds on what profes sionalism means and how it can be achieved—in short more two-way communication. For example, manage ment needs to make clearer its desire to promote in dividual responsibility on the part of engineers, som of whom seem to feel lost in a mass, and management in turn needs to become more aware of the wide rang of engineers' aspirations."

Survey findings were based on 350 personal inter views. The engineers all hold college or advance de grees in engineering and are employed in recognize engineering assignments.

The published survey reports may be obtained from the National Society at $4 per copy for non-member and $2 for members.

UNIVERSITY OF ILLINOIS DIVISION OF UNIVERSITY EXTENSION, URBANA

In Cooperation With The College of Engineering Announces A Course

PROFESSIONAL ENGINEERING REFRESHER

COURSE DESCRIPTION:

This course is planned primarily for those who wish to take the State examination for registration as a licensed Professional Engineer. It offers a brief review in the fundamentals of engineering mathematics, mechanics, electricity, and strength of material. A large part of the course is devoted to the solution of typical engineering problems in the fields of engineering economy, civil engineering, mechanical engineering and electrical engineering with emphasis on the fundamental laws involved in their solutions.

PLACE AND TIME:

Six sections of the course are offered. Classes meet eleven weeks.

Arlington Heights, High School, 502 W. Euclid, Room 220, 7:00-9:50 p.m. on Wednesdays beginning February 1, 1961.

Chicago, Navy Pier, Grand Avenue at the Lake, Room 65, 6:30-9:20 p.m. on Mondays beginning January 30, 1961.

Elgin, Community College, 373 East Chicago Street, Room 205, 7:00-9:50 p.m. on Wednesdays beginning February 1, 1961.

Joliet, Junior College, 201 E. Jefferson Street, Room 253, 7:00-9:50 p.m. on Tuesdays beginning January 31, 1961.

LaGrange, Lyons Township High School, 100 South Brainard, Room 180 Vaughn Building, 7:00-9:50 p.m. on Mondays beginning January 30, 1961.

Villa Park, Willowbrook High School, 1250 South Ardmore, 7:00-9:50 p.m. on Tuesdays, beginning January 31, 1961.

East St. Louis, Senior High School, 4901 State Street, Room 119, at 7:00-10:00 p.m., on Thursdays beginning February 2, 1961. The class will meet for 11 weeks.

Moline, Moline Community College, 1001 Sixteenth Street, Room 305, at 6:30 p.m., on Thursdays, beginning February 2, 1961. The class will meet for 11 weeks.

PROFESSIONAL CORNER

When this column was set up several months ago, we hoped we would have letters from our members to use each month.

WHA' HOPPENED?

If you have nothing to get off your chest, we do! Many ISPE-NSPE members have returned dues statements with the NSPE portion crossed through and that amount deducted from their accompanying checks. Because our Constitution states "all National Members and Engineer-in-Training Members shall be members of the National Society," members may not arbitrarily choose otherwise.

The office cannot accept your checks under these circumstances and have had to return a number of them—at a time when we're busy, busy, busy!

Please pass this word around in your chapter to any members who have followed such a course.

TUITION AND FEES:

$24.00 per person. Registration will be conducted at the first class meeting and fees are payable at that time.

INSTRUCTOR:

Members of Engineering College Faculty.

The above courses are planned as preparatory to the examinations to be given in May of this year. A schedule of courses to be begun in the fall, which will be preparatory to the examinations to be given in December, will be announced later.

Examination schedules are as follows:

First Day (EIT)	Second Day	Final Filing Date	Location
May 4, 1961		Mar. 10, 1961	Chicago, Urbana, & Evanston
	May 5, 1961	Mar. 10, 1961	Chicago
Dec. 7, 1961		Oct. 4, 1961	Chicago & Urbana
	Dec. 8, 1961	Oct. 4, 1961	Chicago

Technicians

(continued from page 1)

which are common knowledge among those who are technically expert in this branch of engineering, or those specially prescribed by professional engineers.

"Under general professional engineering direction, or following established engineering techniques, he shall be capable of carrying out duties which may comprise: working on design and development of engineering plant; draftmanship; the erecting and commissioning of engineering equipment or structures; estimating, inspecting and testing engineering equipment; use of surveying instruments; maintaining engineering machinery or engineering services and locating faults; operating maintaining, and repairing engineering plant; or activities connected with research and development, sales engineering and representation, servicing and testing of materials and components, advising consumers; and training and education.

"In carrying out many of these duties, the competent supervision of the work of skilled craftsman will be necessary. The techniques employed demand acquired experience and knowledge of a particular branch of engineering, combined with the ability to work out the details of a job in the light of well-established practice.

"An engineering technician, therefore, requires a background sufficient to enable him to understand the reasons and purposes of the operations for which h is responsible."

It will be noted that this definition pictures a tech nician as a person with definite aptitudes in his chose field, with training in that field, and with versatilit It also dictates that such a person should be provide with the opportunity of growing in the technician fiel as his knowledge and experience increase.

It was determined that the concern for the affai of the engineering technician should be divided a follows: (1) ECPD—with formal educational develop ment; (a) Technical Societies—with the technical de velopment of the engineering technician; (3) NSPE— with the status and related problems of engineerin technicians.

The matter of status, with relationship to the en gineering technician, is an important one. It becam evident that the matter of recognition and prestig for the engineering technician is crucial. About th only course of action open to the technician at presen is to turn to unionization. However, this defeats, to great extent, the philosophy of the engineering tech nician definition, as advancement through unionizatio is determined primarily by length of service, and ig nores the elements of responsibility and training.

It was decided, almost immediately, that it would be difficult and probably unwise to attempt to bring

(continued on page 32)

47TH ANNUAL ILLINOIS HIGHWAY ENGINEERING CONFERENCE
and
13TH ANNUAL ILLINOIS TRAFFIC ENGINEERING CONFERENCE

203 Civil Engineering Hall
Urbana, Illinois

The 47th Annual Illinois Highway Engineering Conference will be held at the University of Illinois on February 28, and March 1 and 2, 1961. The Conference is being sponsored jointly by the Illinois Association of County Superintendents of Highways, the Illinois Division of Highways, the Public Works Section of the Illinois Municipal League, Township Officials of Illinois, Associated General Contractors of Illinois, and the Department of Civil Engineering of the University of Illinois with the cooperation of the Division of University Extension.

HIGHWAY CONFERENCE

Program Outline

Tuesday, February 28

9:00 - 12:30	General Session. Latest Developments in Highway Engineering
2:00 - 5:00	Subject Group Meetings. Open Discussion of Selected Highway Subjects

Wednesday, March 1

8:45 - 12:30	General Session. Highway Legislation, Planning, Administration, and Finance
2:00 - 5:00	Agency Group Meetings State, County, City, Township and Road District, and Contractor Problems
6:30	Annual Banquet

Thursday, March 2

8:30 - 11:30 1:00 - 4:00	Subject Group Meetings. Open Discussion of Selected Highway Subjects

TRAFFIC CONFERENCE

Program Outline

The 13th Annual Illinois Traffic Engineering Conference will be held at the University of Illinois on March 2 and 3, 1961. The Conference is being sponsored jointly by the Midwest Section of the Institute of Traffic Engineers, and Illinois Division of Highways, the Public Works section of the Illinois Municipal League, and the Department of Civil Engineering of the University of Illinois with the cooperation of the Division of University Extension.

Thursday, March 2

8:30 - 11:45	Community Planning and Traffic
1:15 - 4:30	Traffic Engineering Management Problems
6:30	Annual Dinner & Joint Meeting With Midwest Section of I.T.E. (Urbana-Lincoln Motor Inn)

Friday, March 3

9:00 - 11:30	Traffic Topics of Current Interest Current Traffic Topics (Program to be arranged)
1:00 - 3:30	Traffic Engineering in Medium and Small Sized Communities

The registration fee will be collected at the registration desk at the conferences. Payment of one fee will cover attendance at both conferences.

76th ANNUAL MEETING OF ISPE

APRIL 20, 21, and 22, 1961

PERE MARQUETTE — PEORIA

The following 19 pages are new questions and drawings which have been used in a revised edition of the Structural Engineers Examination Book, published by the Illinois Society of Professional Engineers.

The entire 2nd Edition of this publication is now available at the Society headquarters office.

Typical Examinations for Registration as Structural Engineer in Illinois

FOREWORD

Some 13 years ago the Department of Registration and Education authorized the Illinois Structural Engineers Examining Committee to select from the questions used during the preceding twenty-five years in examining applicants for registration as Structural Engineers in the State of Illinois typical sets from each of the four examinations required of applicants. The purpose was to acquaint the profession with the character of the examinations being used to test applicants for registration in this field.

In accordance with that authorization the Committee selected ten typical sets of questions from each of the four examinations required: Examination "A," General Engineering Knowledge; Examination "B," Reinforced Concrete; Examination "C," Structural Steel; Examination "D," Wood Masonry and Foundations.

In order to reach the interested people the offer of the Illinois Society of Professional Engineers to publish the sets of questions in its journal, THE ILLINOIS ENGINEER, was accepted.

Since that publication the sets of questions have been reproduced and used occasionally in "Refresher Courses" designed to assist applicants seeking registration as Structural Engineers. These courses have been organized and administered jointly by the Illinois Society of Professional Engineers and the University of Illinois Division of University Extension.

The supply of these reproductions is now exhausted and the Illinois Society of Professional Engineers has proposed that they be incorporated with additional questions, taken from more recent examinations, and republished in a booklet similar to that issued by the Society (in cooperation with the University of Illinois Division of University Extension) covering typical examinations and questions used in connection with the registration of Professional Engineers.

This booklet is widely used in connection with so-called refresher courses designed to assist applicants for registration as Professional Engineers, and there appears to be a need for a similar booklet covering the field of Structural Engineering.

To assist in meeting that need, and to keep the profession informed regarding the character of registration examinations, the Department of Registration and Education is now releasing for publication typical questions selected from each of the four examinations required of applicants for registration as Structural Engineers. These questions are from examinations used since 1950.

It is not now the policy of the Department to publish complete examinations and it is to be understood that the questions now released are merely typical of those used in the four examinations required and do not constitute in any sense any actual examinations.

It may be of interest to note that each of the four examinations required of applicants for registration is of four hours duration. The applicants are not allowed to use books or reference material during the first examination, Examination "A," General Engineering Knowledge. During the other three examinations the applicants are permitted to use the books and other aids generally available in an engineering office. However, answers to questions taken directly from published tables are not acceptable and the applicant is required to present his own solutions and calculations in sufficient detail to demonstrate that he has a thorough understanding of the underlying principles.

The following are excerpts from the "RULES AND REGULATIONS PROMULGATED FOR THE ADMINISTRATION OF THE ILLINOIS STRUCTURAL ENGINEERING ACT."

IV. Examination

3. An applicant must score an average grade of 75% or greater, with no grade below 60%, to pass the written examination.

4. An applicant who fails to pass the written examination will be given credit for those divisions in which he scored 75% or greater as provided in Paragraph 5 below, if he appears for re-examination within one year of the date of the previous examination.

5. An applicant who fails to make an average of 75% with no grade below 60% in his third examination, forfeits all previous grades and is required to retake all subjects on his fourth examination.

   If, allowing similar credits from his fourth and fifth examinations, he fails to pass his sixth examination, this procedure shall repeat itself every three examinations.

Very truly yours,

Vera M. Binks, Director

Department of Registration and Education

State of Illinois

Second Edition

December, 1960

The questions added in this new edition are from examinations given during the years 1957, 1958 and 1959 and were provided by the Structural Engineers Examining Committee under the Chairmanship of Clifford H. Westcott. Acknowledgment is gratefully made to A. L. R. Sanders, Secretary of the Committee, for his co-operation in selection of questions, and to C. Dale Greffe, Professor of Mechanical Engineering, University of Illinois, and Vice President of the Illinois Society of Professional Engineers, for arrangement and supervision of reproduction.

A28. A steel tape is correct length at a temperature of 50°F. It was used at 100° to measure two sides of a right triangle and they were recorded as 559.83 feet and 639.79 feet. What is area of triangle in acres?

A29. Which is the heavier of each pair below?
(1) Fir or oak timber
(2) Lead or zinc
(3) Aluminum or manganese
(4) Cast iron or cast steel
(5) Petroleum or graphite
(6) Alcohol or Water
(7) Helium or hydrogen
(8) Coke or anthracite
(9) Clay or sand (both dry)
(10) Platinum or gold

A30. (a) A missile is fired upward in a vertical direction with an initial velocity of 4,000 ft. per second. Assuming no air resistance, how many seconds will it take to reach a height of 40,000 ft. above its initial position?
(b) In how many seconds will it take after it is fired, to fall back to an elevation of 40,000 ft. after attaining its maximum height?

A31. Determine the magnitude and location of the pressure force P on the rectangular sloping gate shown in Fig. A31.

A32. Illustrate by free hand sketches, in a general way, the following:
(a) Chicago type building caissons.
(b) Off shore caissons for bridge piers.
(c) Gravity type retaining wall.
(d) Reinforced concrete retaining wall.
(e) Wood and concrete composite pile.
(f) Prestressed concrete beam.
(g) Post-tensioned concrete beam.
(h) Reinforced brick masonry.
(i) Raft foundation.
(j) Rigid frame.

A33. What force applied in the direction indicated in Figure A33 will be required to roll a 150 lb. lawn roller up an incline, having a slope of 2½ ft. vertical in 10 ft. horizontal? Neglect axle friction.

A34. Locate the centers of gravity, and compute the moment of inertia about Axis X-X, shown in Fig. A34.

A35. The three bars shown in Figure A35 are without initial stress and then loaded with 20 tons.

Assume:	Steel	Copper
Modulus of Elasticity	30,000,000 psi	15,000,000 psi
Coefficient of Expansion per degree Fahrenheit	.0000065	.0000093

(a) How much will the bars stretch in 8″, and what will the stress be in each bar?

(b) The temperature is then dropped 50 degrees centigrade. How much will the bars be shortened, and what will be the stress in each bar?

A36. An I section steel girder is made up of the following material, web. 14 inch by ¾ inch, top plate 14 inch by 1½ inch, and bottom plate 10 inch by 1¼ inch. Calculate the moment of inertia of the combined section, the section moduli, the radius of gyration and the location of the major neutral axis.

A37. Within the accuracy of slide rule what is the weight of the following:
(a) Concrete block 20.5 ft. x 17.2 ft. x 31.4 ft.
(b) Water filling a cylindrical tank 12 ft. diameter by 28 ft. high.
(c) Cast iron frustrum of a pyramid 18 inches high with a square top 12x12 inches and a rectangular base 20x24 inches.
(d) A lead sphere 8 inches diameter.
(e) An aluminum cone 10 inches high with a base 18 inches diameter.

A38. A 6 inch by 10 inch beam is supported at points 30 inches apart and carries a load of 20,000 lbs. midway between the supports. Find the magnitude and the direction of the resultant maximum tension, shear and compression at a section 10 inches from the left support at a point on the neutral axis and at a point 5 inches below the neutral axis.

A39. Give allowable working stresses for the following:
(a) Structural Steel (ASTM A7)
(1) Axial tension
(2) Axial compression for columns centrally loaded and with values of $\frac{l}{r}$ not greater than 120.
(3) Shear in plate girder webs, cross section.
(4) Bearing on power driven rivets.
(b) Timber (Dense Select Yellow Pine)
(1) Fiber stress in bending
(2) Maximum horizontal shear
(3) Compression perpendicular to grain
(4) Modulus of elasticity

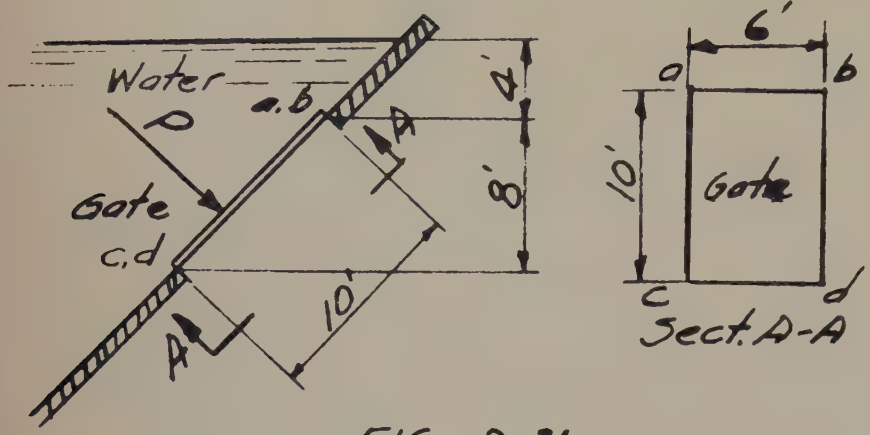


FIG. A-31

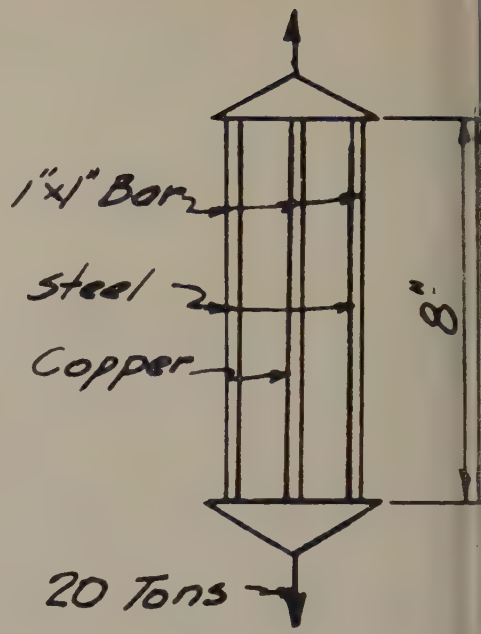


FIG. A-35

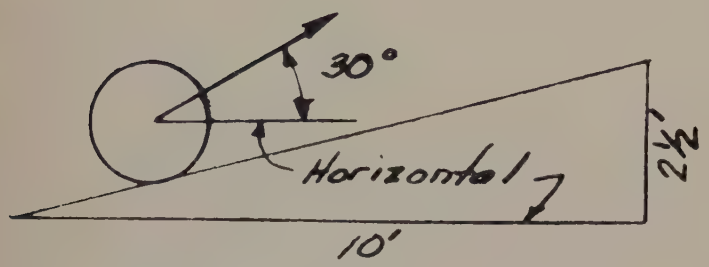


FIG A-33

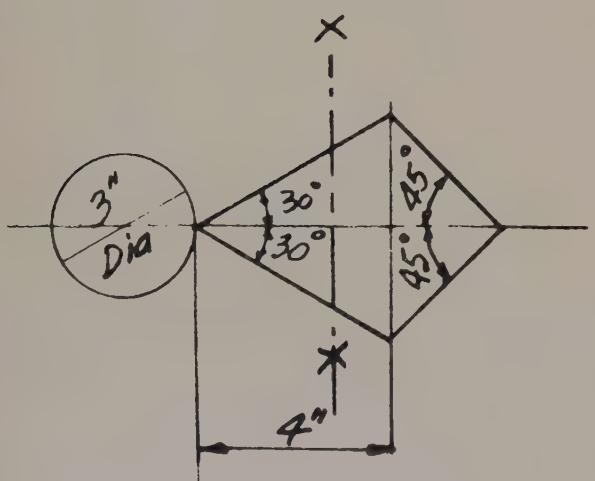


FIG A-34

B12. Design the concrete joist floor system shown in Figure B12. Assume 12″ joist spaced 25″ ctrs. plus 2½″ top slab with a total dead load of 75 psf.

(a) Indicate the reactions for full live and dead load in all spans, for live load in center span only, and for live load in outer spans only.

(b) Design the concrete joist floor system.

B13. Design the retaining wall for the conditions shown in Figure B13. (Omit the design of footing.)

B14. Fig. B14 represents a cross section of a highway viaduct having a concrete slab and girder deck with a three inch bituminous concrete wearing surface. The spans center to center of bents are 50 feet each. The live load consists of two lanes of H20S16 loading. (Front axle 8K, middle axles 32K at 14′ back of front axle and trailer axle 32K at 14′ to 30′ back as needed to produce max. moment or shear.) Use 30% impact.

Design ONLY the cap and columns of the bent as a rigid frame for vertical loads. Do not design deck or foundation. Consider columns fixed at base.

B15. What is meant by "prestressed concrete" and discuss its purpose. Outline desired properties of materials, methods of applying prestress and basic design principles. Describe benefits of this type construction.

B16. Fig. B16 shows a bent with one column and a doubly cantilevered cross girder. You are to hold to the dimensions and spacings given for size of column and location of reinforcement. Assume f′ @ 3000 psi., and intermediate grade deformed bars.

Calculate area of column reinforcement required at bottom of column. Show size and number of bars and spacing. (Design as a tied column.)

Calculate size and spacing of column ties required near bottom of column.

B17. Determines the size of the reinforcing bars required for the highway bridge beam shown in Figure B17 when subjected to the moving loads indicated. Impact coefficient 31%. Maximum f=18,000 psi N=10.

What is the maximum compressive stress in the concrete?

B18. Figure B18 indicates a cross section through a cntinuous concrete tee beam at a point of maximum negative moment. Calculate the maximum stress in the concrete and the reinforcement for a negative moment of 524,000 ft. lb. Assume 3,000 lb. concrete. A.C.I. Design Handbook may be used in solving this problem.

B19. (a) Design the one-way floor slab of the mezzanine floor in Figure B19 using f′c=3750 psi with sand and gravel aggregate. The building is a department store where an allowance of 25 psf shall be made for floor finish and acoustical ceiling. Design shall include a cross section sketch showing the position of all reinforcement.

(b) Design the beam marked "X" for the center span condition in this building which is 140 ft. long, indicating the position of all bars.

(c) Assume the floor slab construction in Figure A is to be built with lightweight concrete weighing 100 pcf. Ec=2,150,000 psi: f′c=3750 psi. Redesign the slab using this material, but not the beams.

B20. Figure B20 is an inverted flat slab which resists a 5 ft. head of water pressure. The soil is a coarse sand with some silt. Assuming the dead load on each column of 120,000 lbs. to be uniformly distributed, state the uniform pressure on the bottom of the slab, excluding live load. Indicate the size and position of the reinforcement in Panel D-E-F-G. f′c=3000 psi.

B21. Design a reinforced concrete floor slab for a steel frame building with six bays of 12 ft. span center to center of beams to carry a live load of 300 pounds per square foot in addition to its own weight. Design reinforcement for all spans. Assume 3000 psi concrete and hard grade reinforcement bars. Prepare a neat sketch showing placement of bars.

B22. Design a rectangular reinforced concrete beam for an 80 ft. span c/c bearings to carry a moving load of two wheel at 20 ft. c/c with 20K on each wheel. Design banding and shear reinforcement and prepare a neat sketch of the reinforcement. Assume fc=1350 psi and fs 20,000 psi. Assume beam laterally supported.

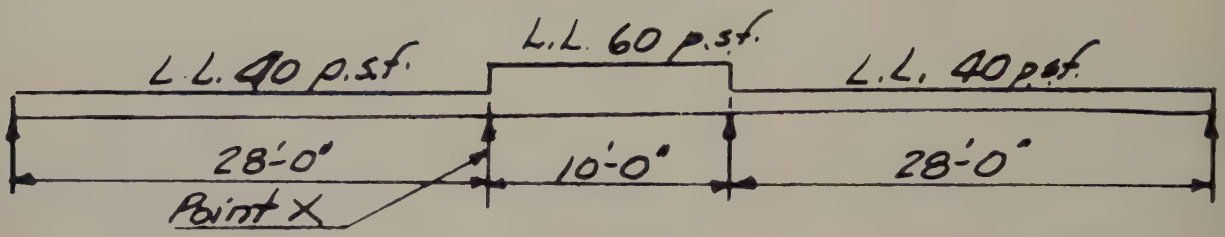


FIG. B-12

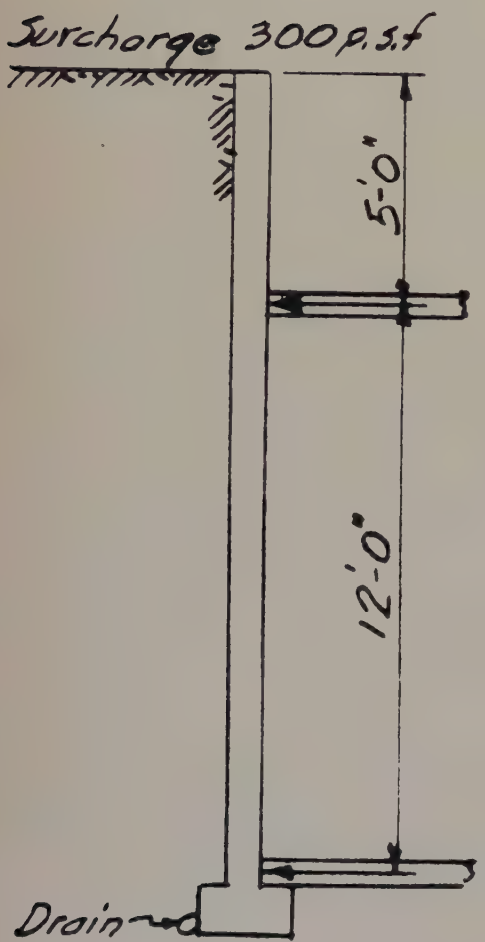


FIG B-13

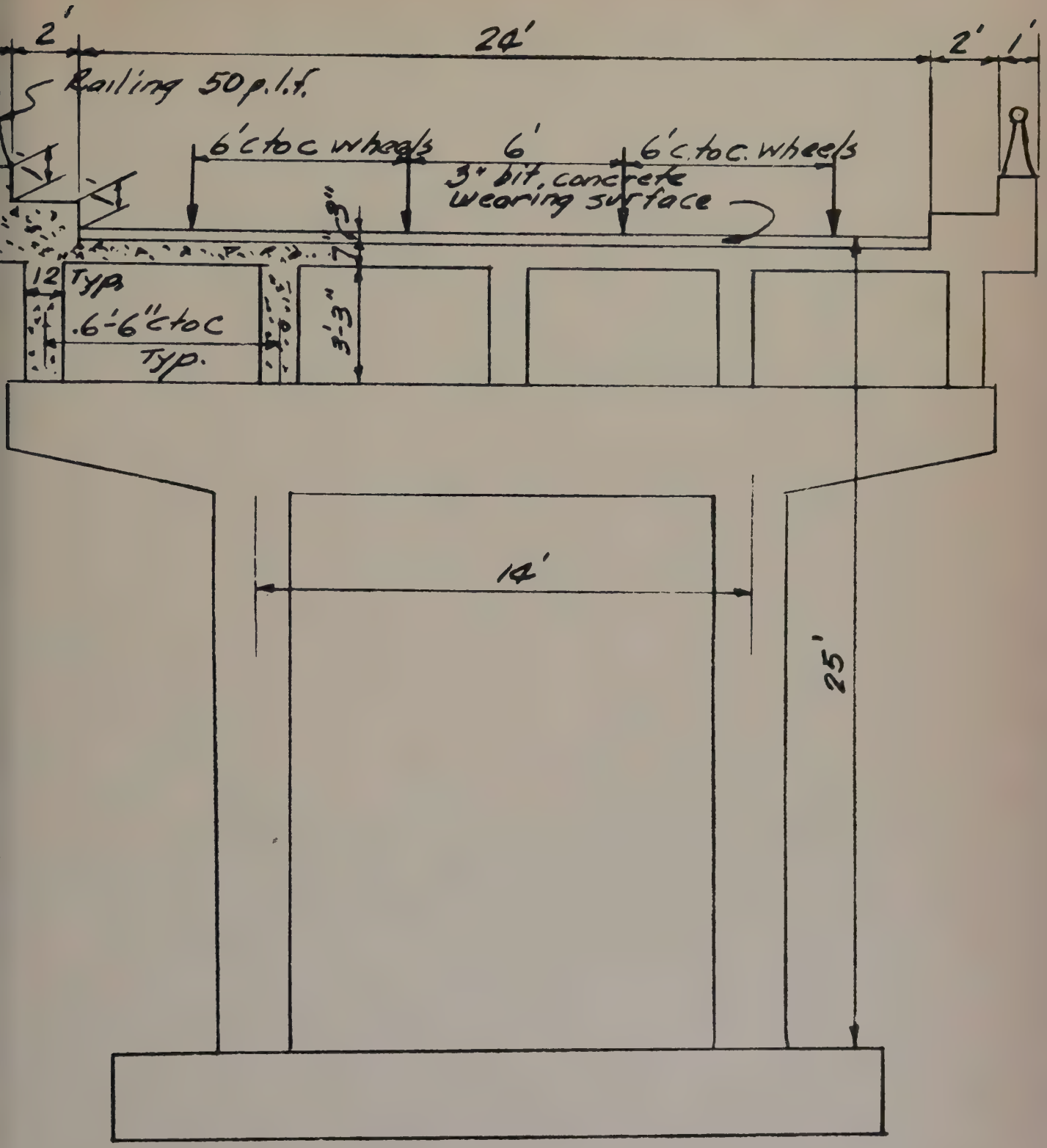

2'
24'
2'
1'
Railing 50 p.l.f.
6' c to c wheels
6'
6' c. to c. wheels
3" bit. concrete
wearing surface
12" Typ.
6'-6" c to c
Typ.
3'-3"
14'
25'

FIG B-14

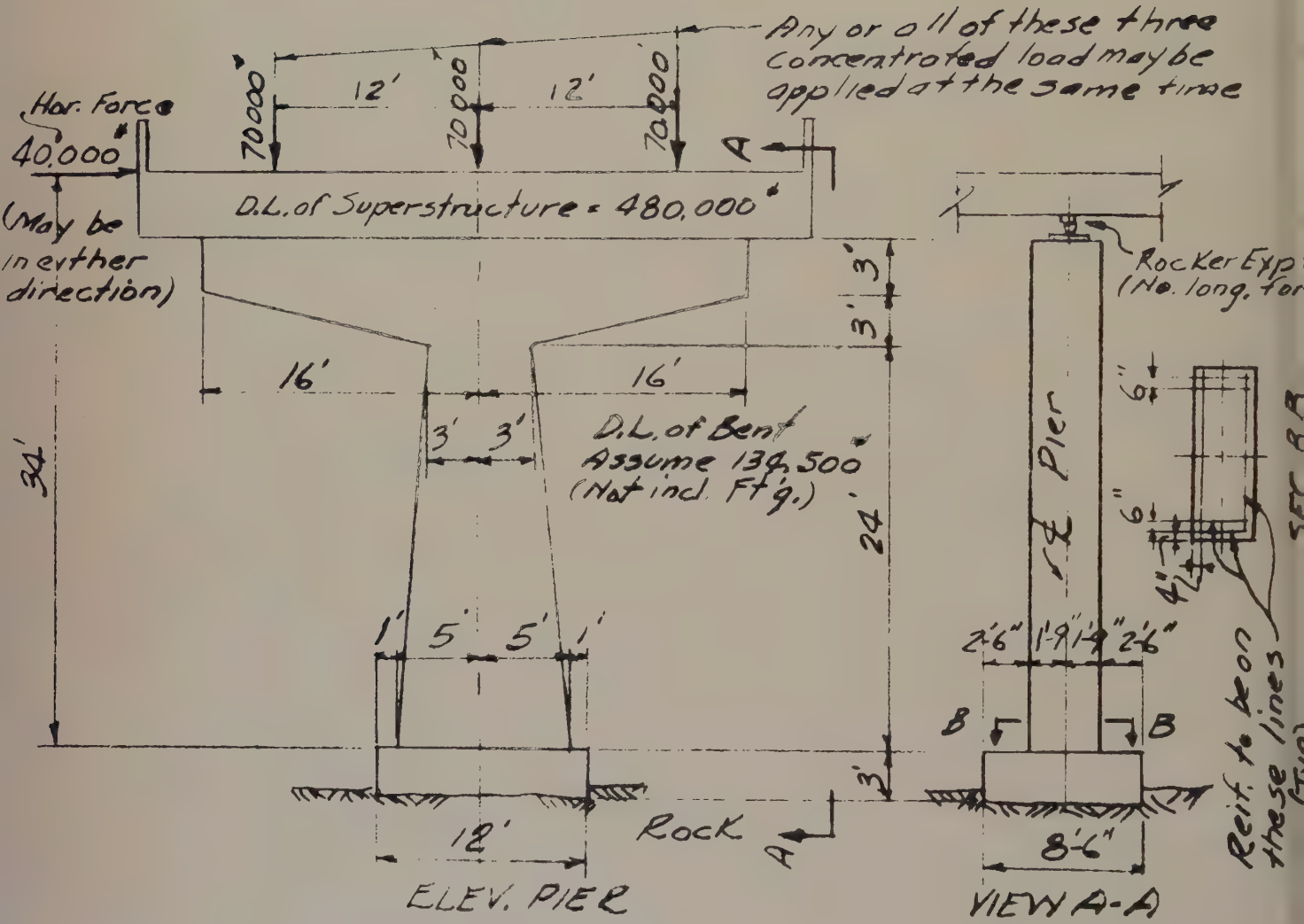

Any or all of these three concentrated load may be applied at the same time
Hor. Force 40,000#
(May be in either direction)
70000#
70,000
70,000
12'
12'
A
D.L. of Superstructure = 480,000#
3'
3'
16'
16'
3'
3'
D.L. of Bent Assume 139,500# (Not incl. Ftg.)
34'
24'
1'
5'
5'
1'
3'
12'
Rock
ELEV. PIER
Rocker Exp
(No. long. for
CL Pier
6"
6"
4½"
2'6"
1'9"
1'9"
2'6"
B
B
A
8'6"
VIEW A-A
Reinf. to bond these lines

FIG B-16

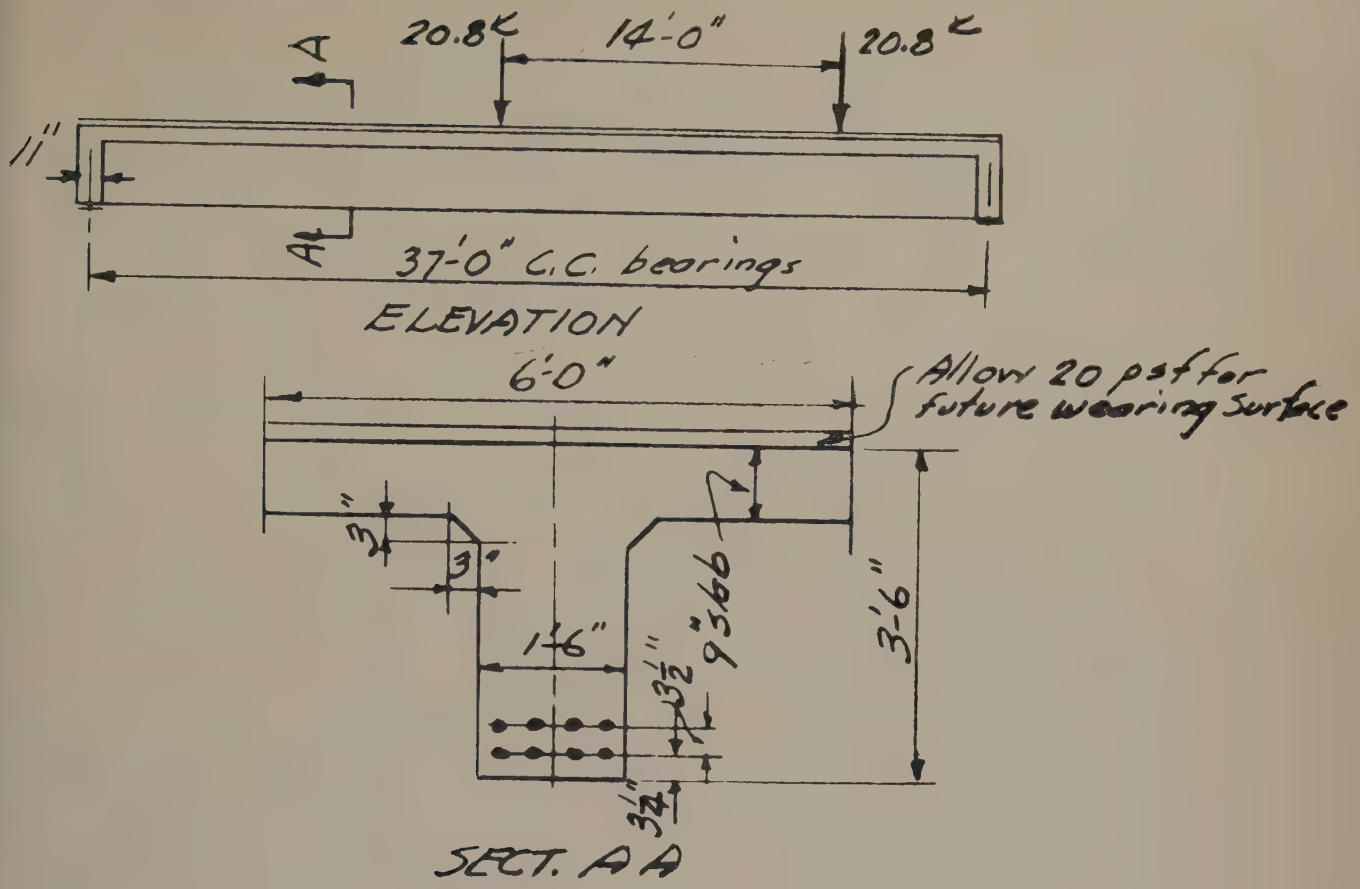


FIG. B-17

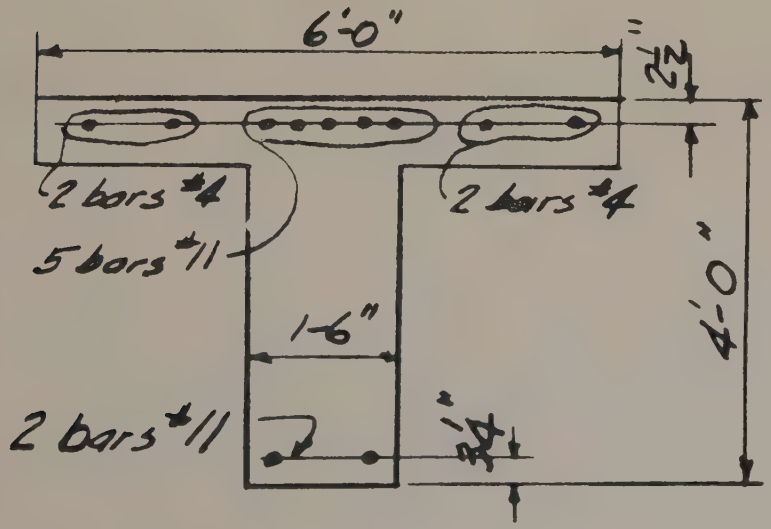


FIG B-18

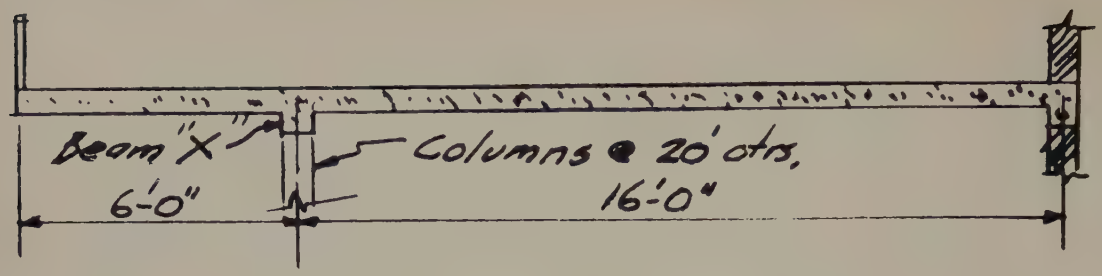


FIG B-19

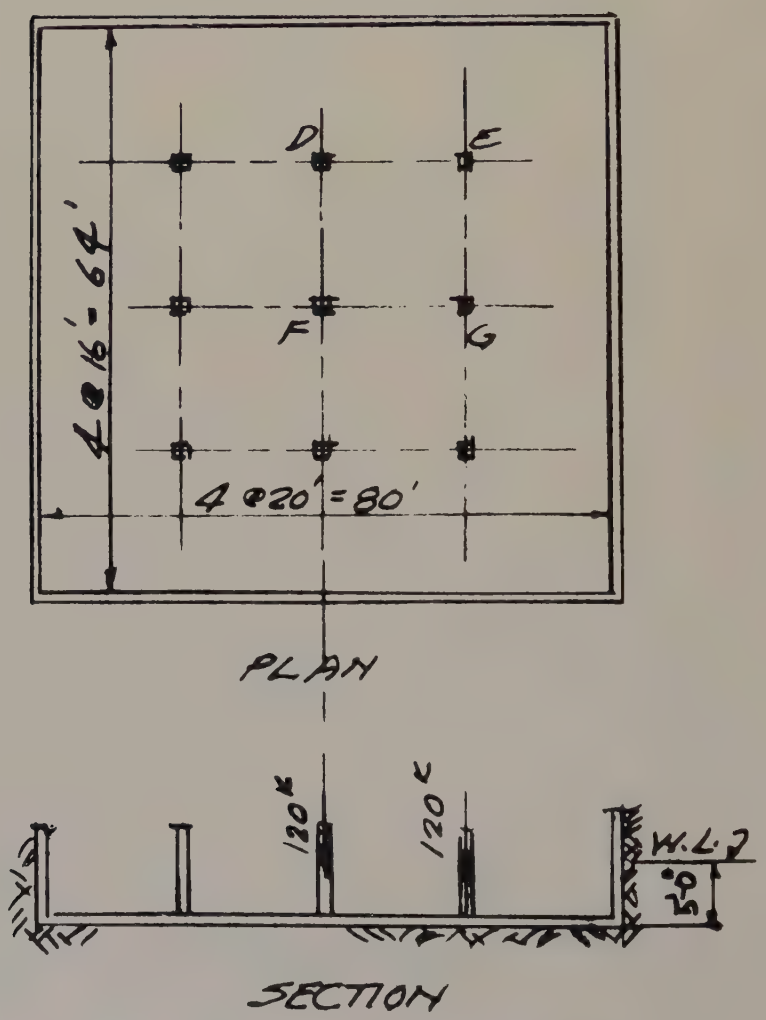


FIG B-20

C18. Find the following for the girder section shown in Figure C18.

(a) The thickness of the cover plate required to carry a moment of 1,250,000 ft. lbs. Use moment of inertia method.

(b) The maximum capacity of the girder in shear.

(c) The maximum capacity of the beam connection.

(b) What is its capacity in shear?
shown in Figure C19 in moment?

(b) What is its capacity in shear?

C20. Figure C20 is a sign support anchored to concrete piers.

(a) Design the horizontal beams A.

(b) Design column B.

(c) Detail the base plate and column anchorage for Column B. (Do not design the concrete pier or foundation.)

C21. (a) Design steel beam A in Fig. C21 so that the positive and negative Moments are equal assuming that the floor construction supports the beam laterally and that there are ten or more 36′ spans in the length of the building.

(b) Design beam B, and detail the connection between beams at the hinge point using ¾″ unfinished bolts in punched holes.

C22. Two beams at right angles to each other, crossing at mid-span of each beam, support a load, jointly, of 250,000 pounds. One beam spans 30 ft. and is a 30″ W F 210 and the other beam spans 20 ft. and is a 36″ W F 245. How much load is carried by each beam? What is the center deflection of the beams? What is the maximum fiber stress in each beam?

C23. A two span rigid frame structure has spans of 45 ft. and 40 ft. and a height of 20 ft. The 45 ft. span has a uniform load of 8 K.I.f. and the 40 ft. span a concentrated load of 250K at 12 ft. from the outer end. Assuming hinges at lower ends of columns and neglecting weight of beams and sidesway, design beams and columns for the structure.

C24. Refer to Fig. C24. Design a girder 50′ long to consist of a 72″ web, 4—6x6x¾ Ls, 14″ wide cover plates, and ⅞″ diameter rivets, to support three concentrated loads of 144,000 lbs. at the center point and quarter points, but considering that one or two, or all three loads may act at the same time. Assume D.L. of girder—400 lbs. per lin. ft. Use either flange area method or moment of inertia method.

C25. Refer to Fig. C25. This represents a 3-span continuous highway bridge, 120′ center to center end bearings. What lengths should be chosen for the spans L_1 and L_2 considering deflection, economy and possible uplift.

C26. Check the design of the stationary crane boom, shown in Fig. C26 which supports a trolley hoist. Assume pinned ends at the points where the boom is bolted to the 14″ building column. Assume the column is not overstressed. Use AISC Specifications.

C27. Draw a stress diagram for the truss in Fig. C27. What is the stress in members (a) 3-4, and (b) 4-5?

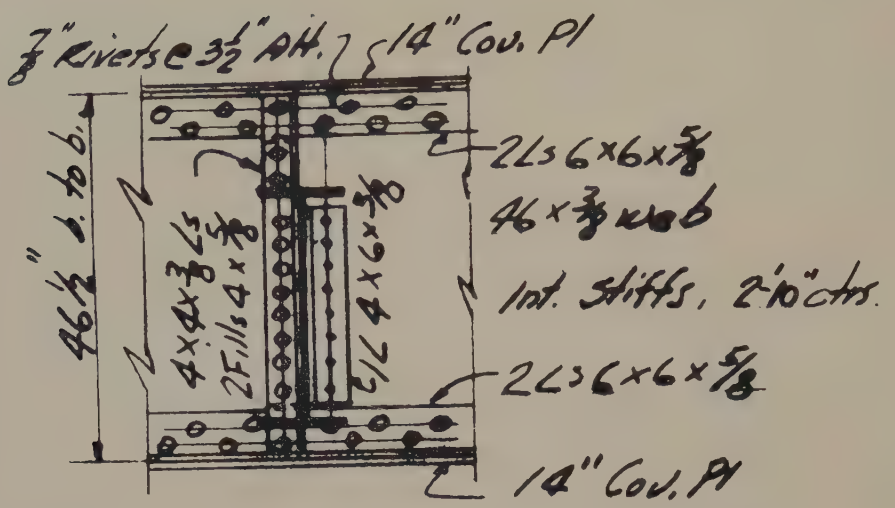


FIG. C-18

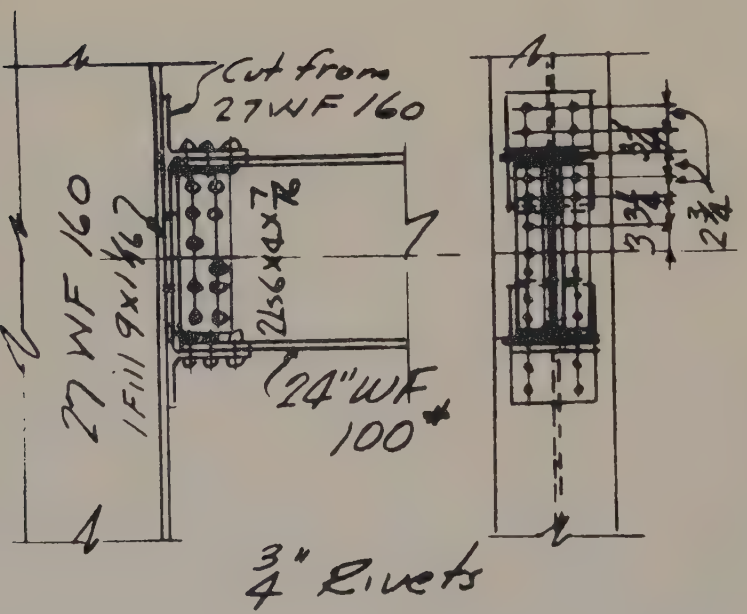


FIG C-19

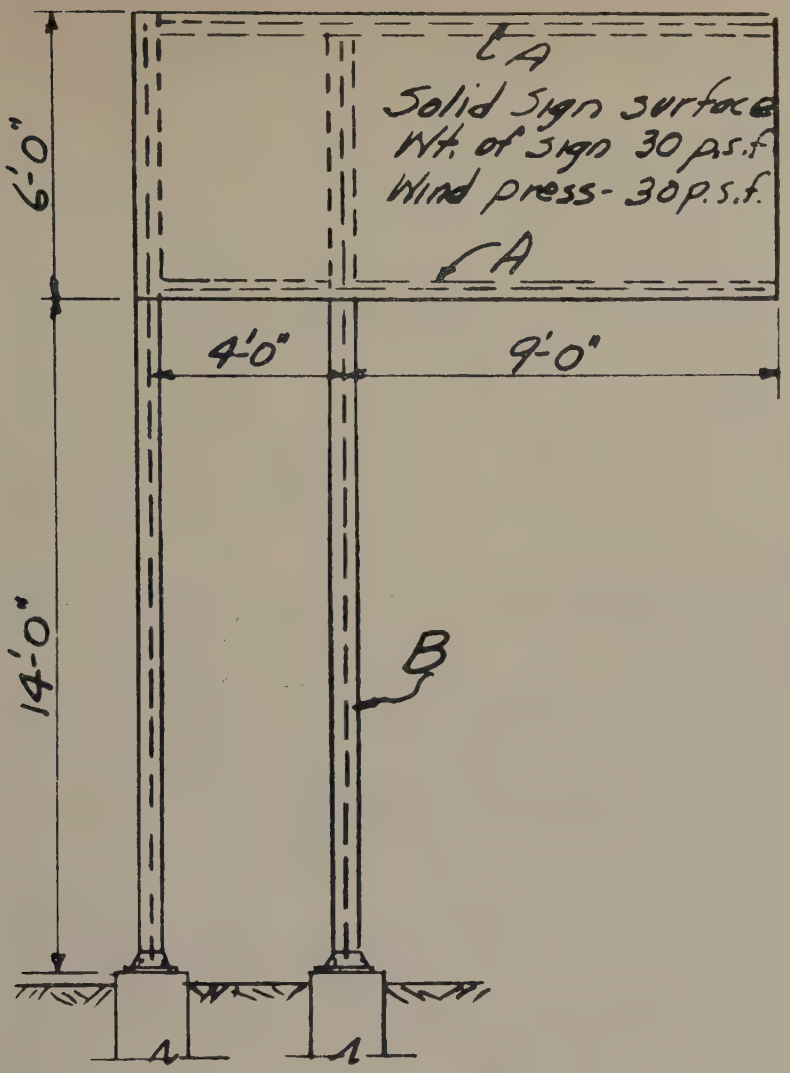


FIG. C-20

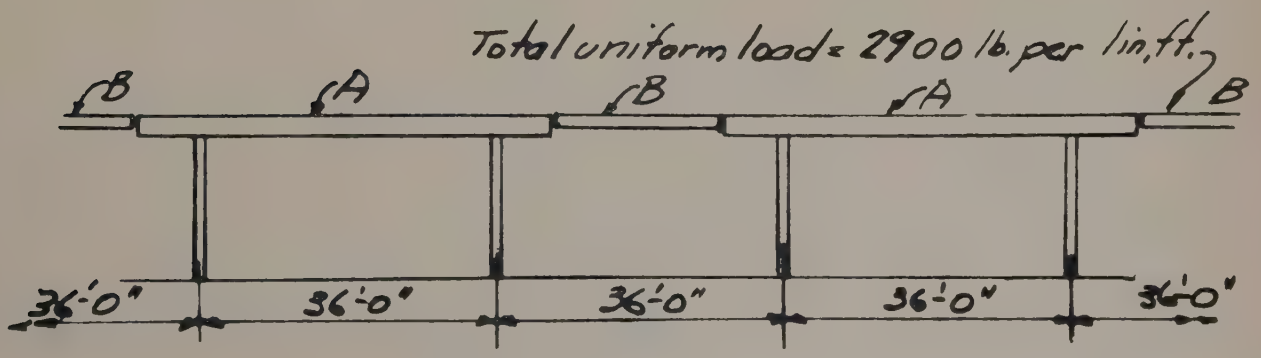
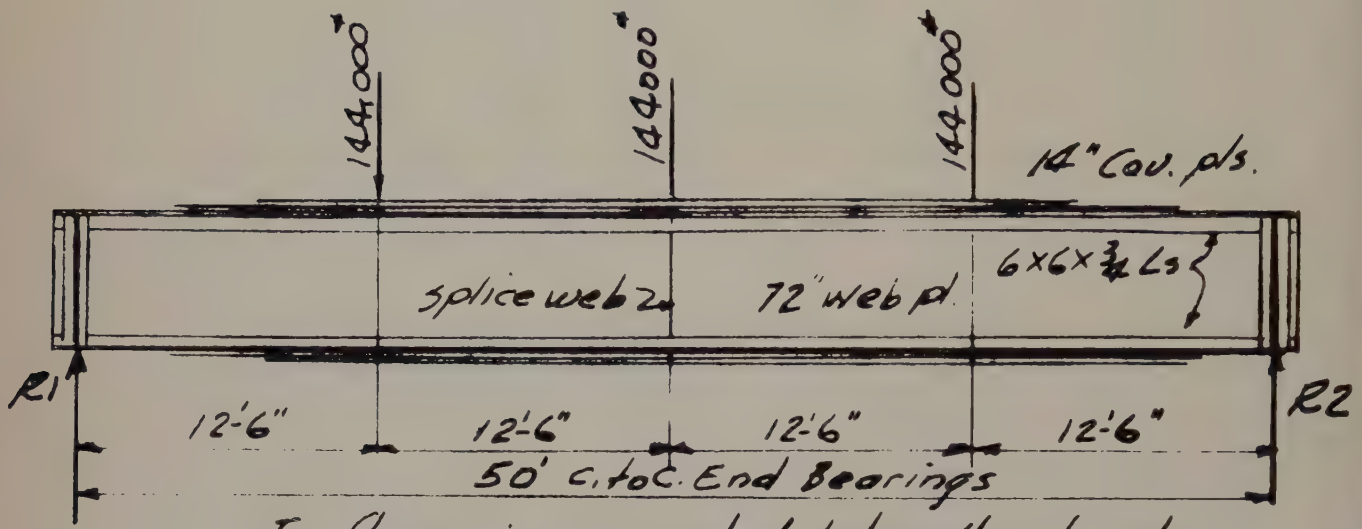
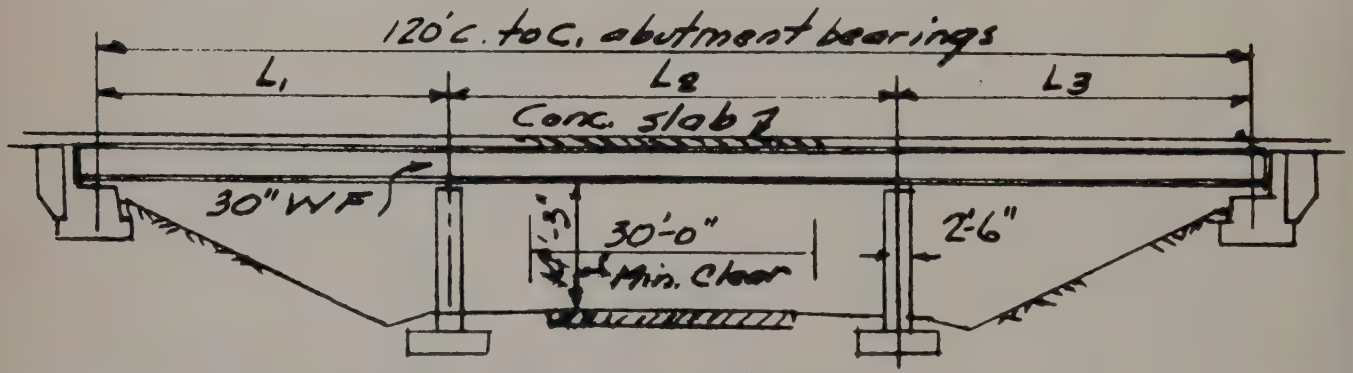


FIG C-21



Top flange is supported laterally at ends and at points of concentrated loads

FIG C-24



D.L. = 800# per lin. ft. of beam
LL+Imp = 800# per lin. ft. of beam

FIG C-25

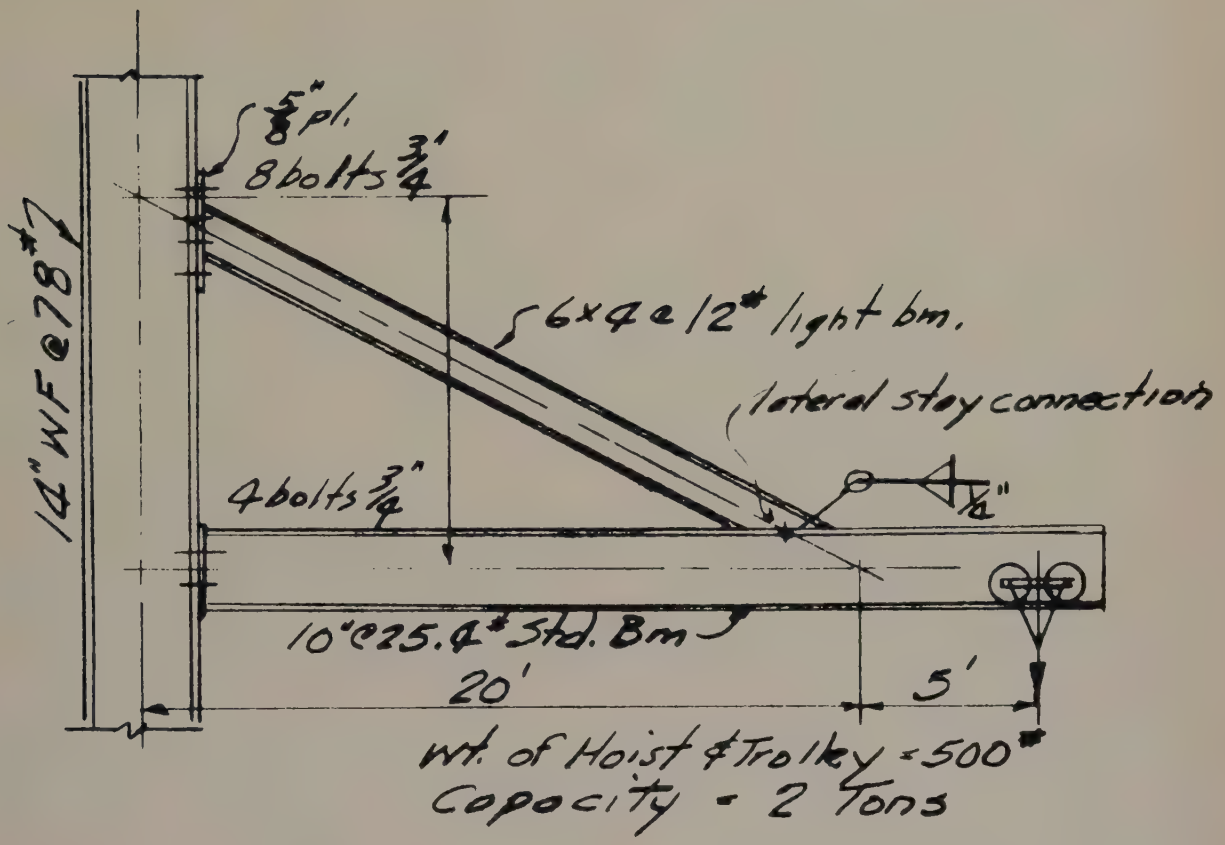


FIG C-26

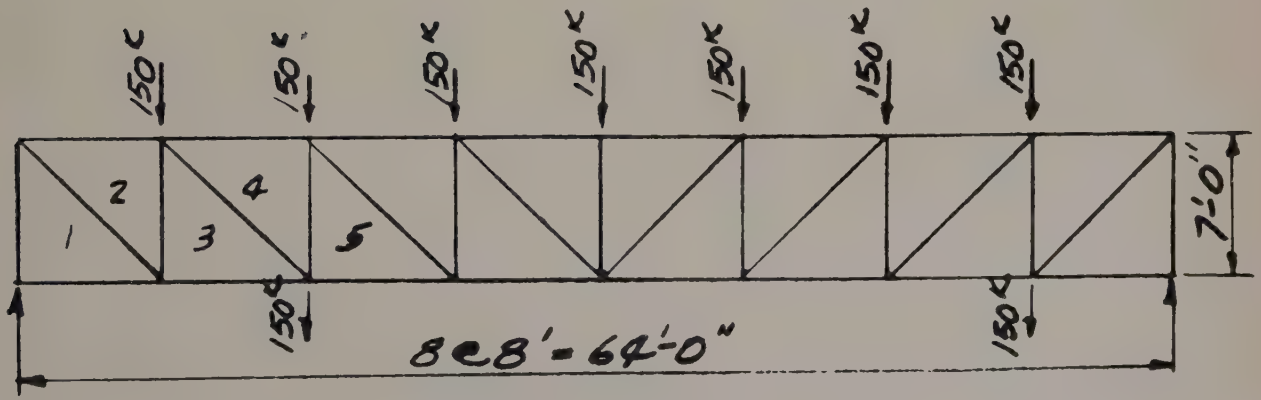


FIG C-27

D16. Fig. D16 shows a square vertical footing that is required to carry a central vertical load of 400,000 lbs. Boring show soil data of reasonably uniform thickness with average properties as shown in the figure. From the results of compressibility test it is concluded that the settlement of a footing 1 ft. wide would be .032 inch per 1000 lbs. pressure per square ft. Assume that the maximum allowable settlement that can be permitted is 1 inch. Neglect weight of footing and earth. Calculate the minimum required plan size of a square footing, for a factor of safety of 3 against failure of the foundation soil.

D17. Fig. D17 shows a footbridge to be constructed between a bridge pier and a pile cluster dolphin. The 6″ x 18″ stringers are available in 32′ lengths, but it would result in too much delay to obtain 42′ lengths, and it is decided to butt splice 32′ and 10′ lengths to make 42′, using two-18″ deep side timbers and ¾″ diameter bolts (Commercial quality), and 3½″ diameter cast washers.

(a) Design butt splice for the stringers to equal 75% of the strength of the 6″ x 18″ stringer in shear and moment.

(b) Calculate the safe, uniform live lead per linear foot of bridge and the safe maximum concentrated live load for the bridge, assuming 150 p.l.f. dead load of bridge; neglect wind, but take into account 1/b ratio for stringers.

D18. Figure D18 shows the elevation and end view of the lower portion of a rigid frame highway bridge pier. The dead plus live load at the bottom of the columns is 400 Kips for exterior and 470 Kips for interior columns. Lateral and longitudinal forces are to be neglected.

(a) What dimensions would you recommend for the base of the pier if it were planned to be built at the location where boring TA was taken?

(b) Answer the same question for a pier at the location of boring TB.

Assume loads are distributed uniformly to the supporting media and calculate the unit load thereon for the type of base selected. Assume also that no further foundation data will be obtained other than that shown on the leg of the borings.

Use Chicago Building Code for allowable soil pressures. If piles are used, assume 20 ton capacity for wood piles, 30 ton capacity for cast in place piles and 40 ton capacity for steel H piles.

D19. Fig. D19 shows a typical soil boring taken on the site of a proposed one-story industrial building for heavy industry. Describe the type of foundation you would recommend, stating your reasons.

D20. (a) In Fig. D20, what uniform live load (per sq. ft.) will the scaffold platform carry, neglecting the dead load?

(b) What deflection can be expected at the outer edge of the platform under full live load?

D21. A wooden truss has a tension in its bottom chord of 250K. Design the member and a full splice for the same using timber connectors using 1600 lb. grade lumber. Make a neat drawing of splice.
Design a concrete retaining wall to retain a level fill of 30 feet above adjacent ground to be supported on timber piles. Do NOT design reinforcement. Make a neat drawing of wall showing dimensions and pile spacing.

D22. A building is to be erected adjacent to an existing building with outside row of columns at 2½ feet from the property line with a load of 1000K per column. The next interior column is 25 ft. in from the outer column with a loading of 1200K per column. Design a combined footing on the basis of an allowable soil pressure of 5K.S.F. Design reinforcement in this problem and make a neat drawing of foundation.

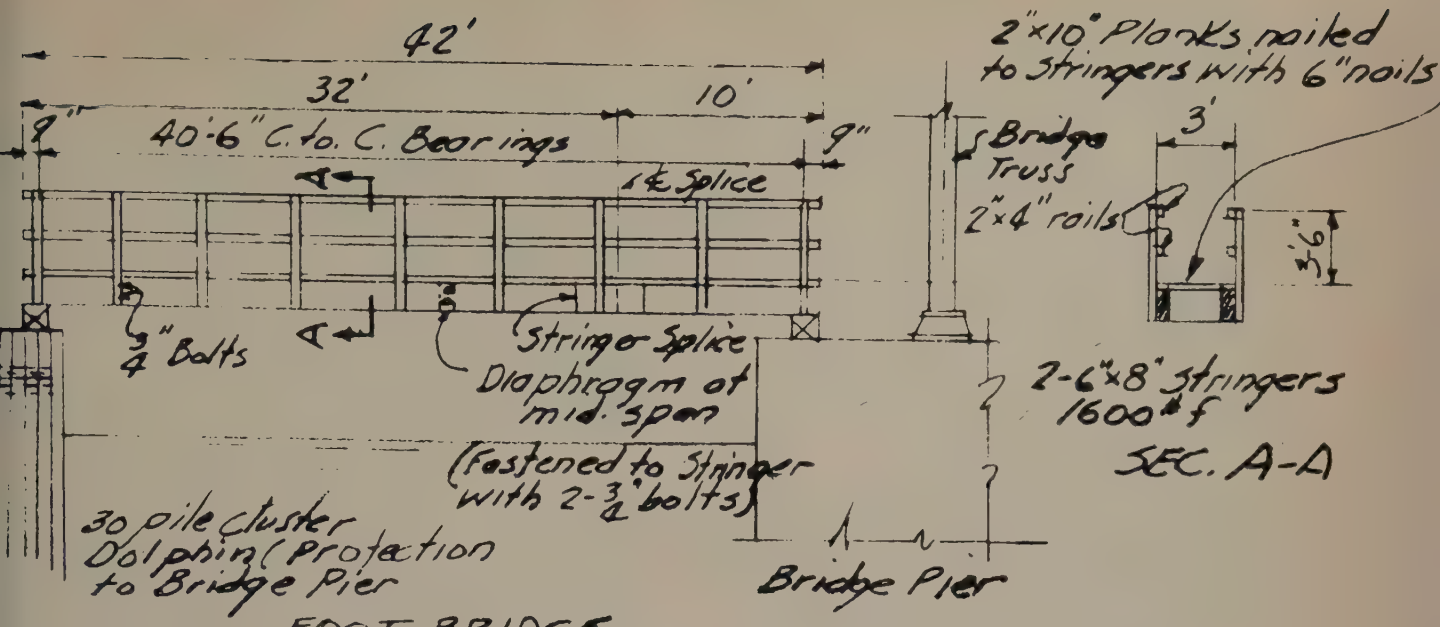
D23. Fig. D23 shows a proposed elevated runway for lift trucks to be constructed of creosoted incised Douglas fir timber, 1600 f grade, and to carry live load shown. Design the plank flooring, stringers, caps and posts.

D24. Fig. D24 shows a cross section of a proposed masonry dam. Assume that hydrostatic pressure under the base varies uniformly from a maximum at the heel to a minimum at the toe. Make a line diagram to show all of the forces acting on the dam, and calculate the resultant of these forces and location where it intersects the base.

D25. Design all the timber required for the roof, 2nd story floor and columns for the two story building shown in Fig. D25.

Joist and Beams—1450 F grade W. C. Douglas Fir Posts—Dense #1 W. C. Douglas Fir.

D26. Design an interior column footing for the building shown in Figure D25 and soil conditions as shown in Figure D26. Soil values per Chicago Building Code.



FOOT BRIDGE

All timber creosote pressure treated.

FIG D-17

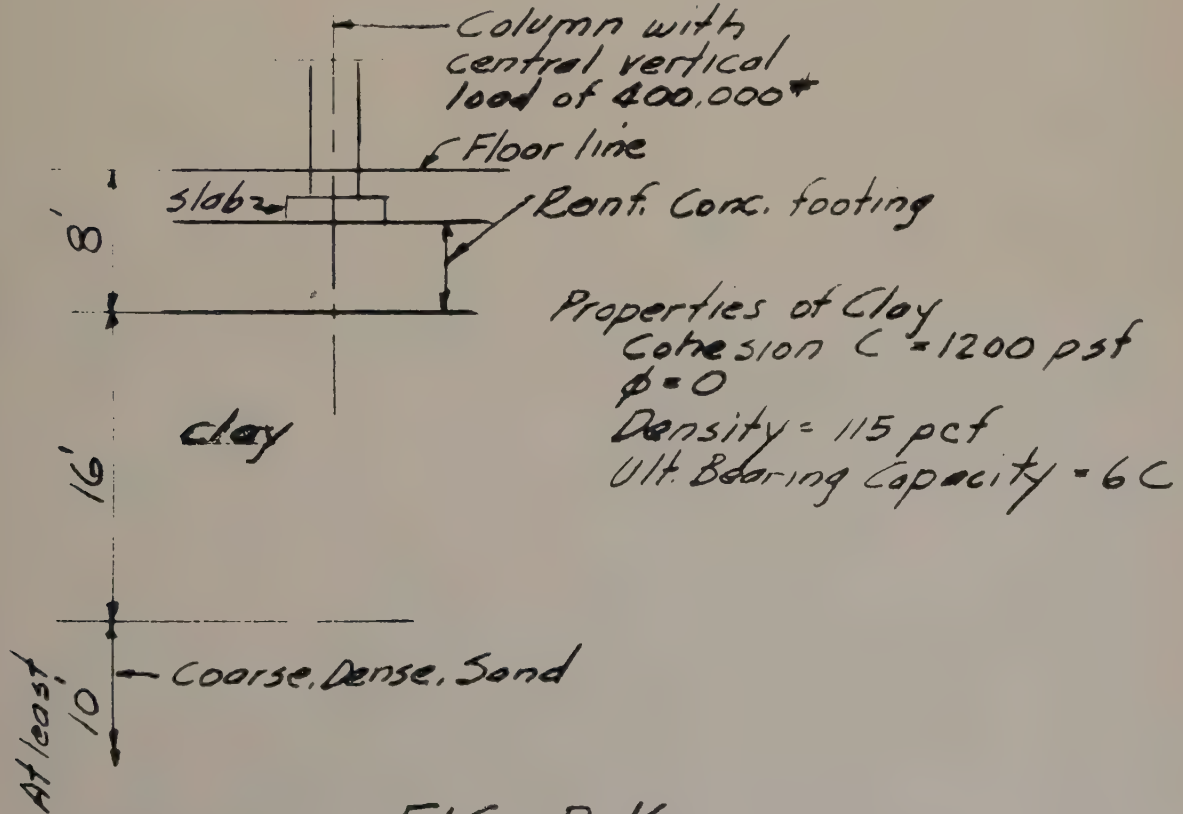
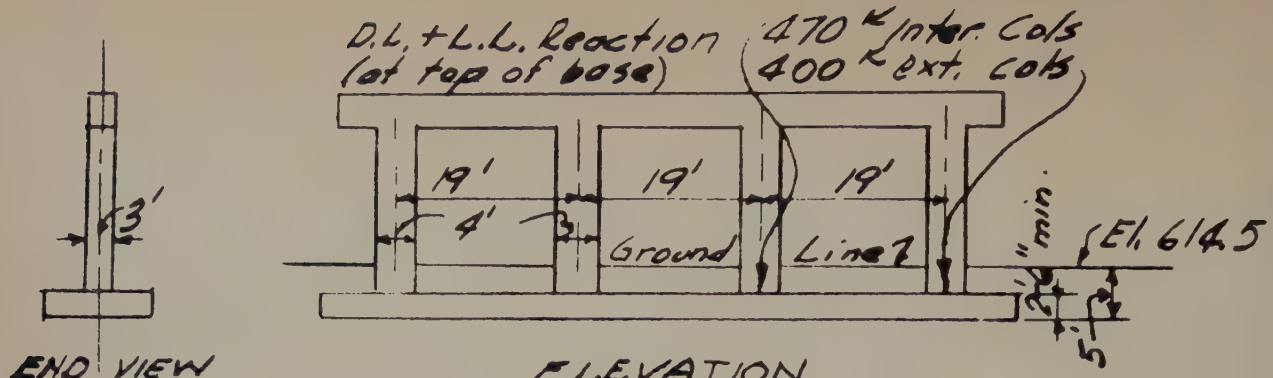


FIG D-16



614.5	
609.5	Fill
606.5	Compact sand stiff pebbly yellow clay
597.5	
593.5	Compact sand
584.0	Gravel
	Rock

LOG - TEST HOLE TA

614.5	
610.5	Sand
608.0	Gravel
607.0	Wood bark
	Fibrous peat
595.0	
	stiff brown clay
577.0	
539.0	Gravel

LOG - TEST HOLE TB

(NOT PLOTTED TO SCALE)

FIG. D-18

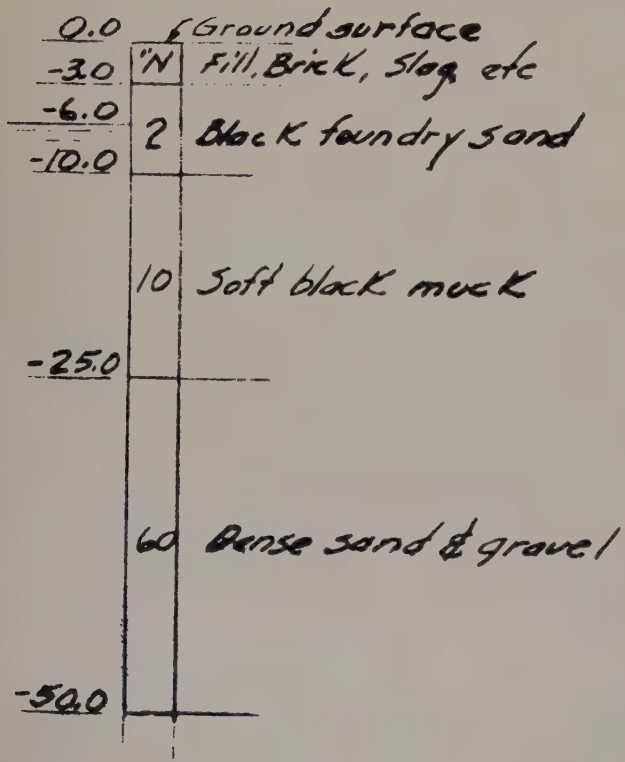


FIG. D-19

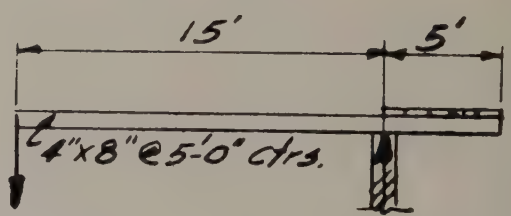


FIG D-20

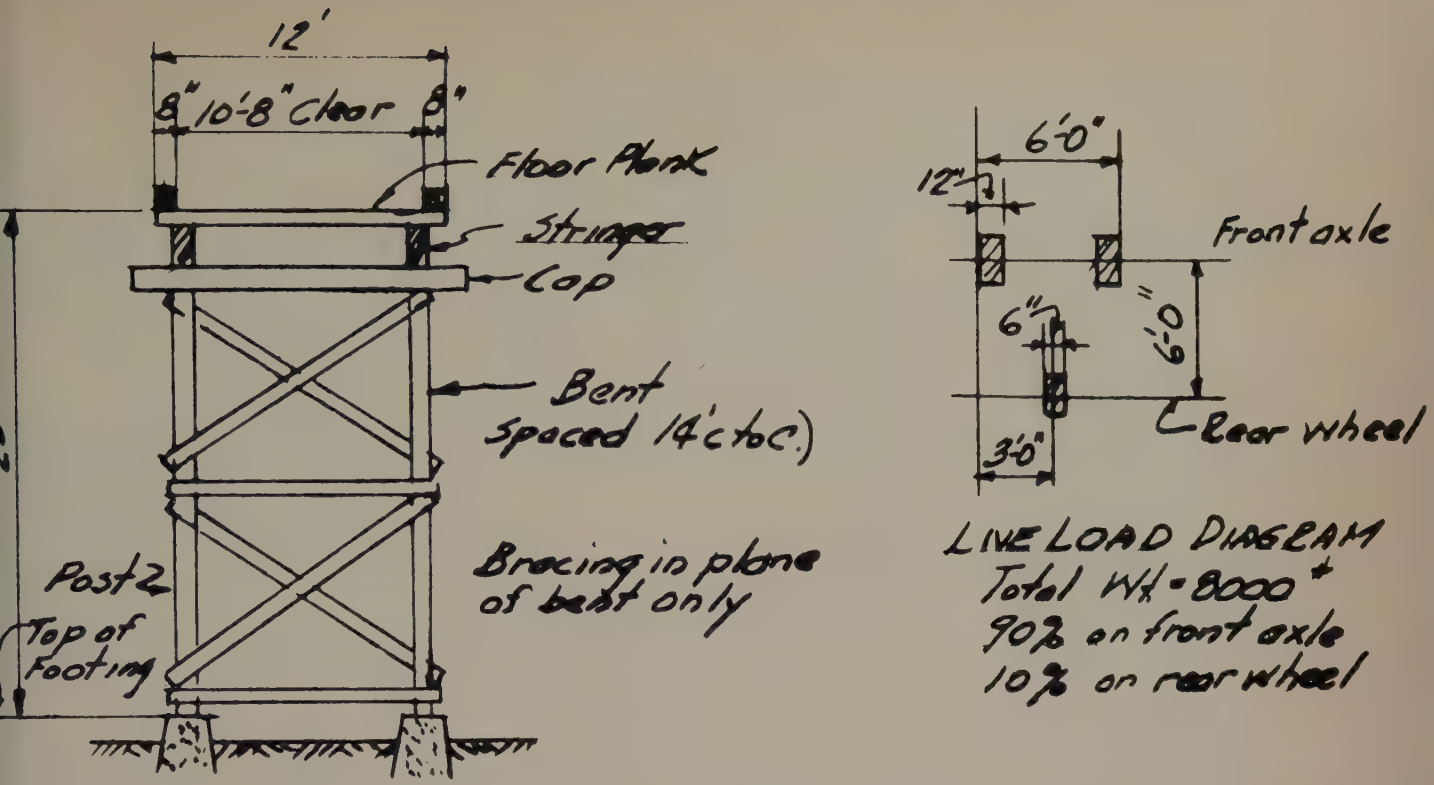


FIG D-23

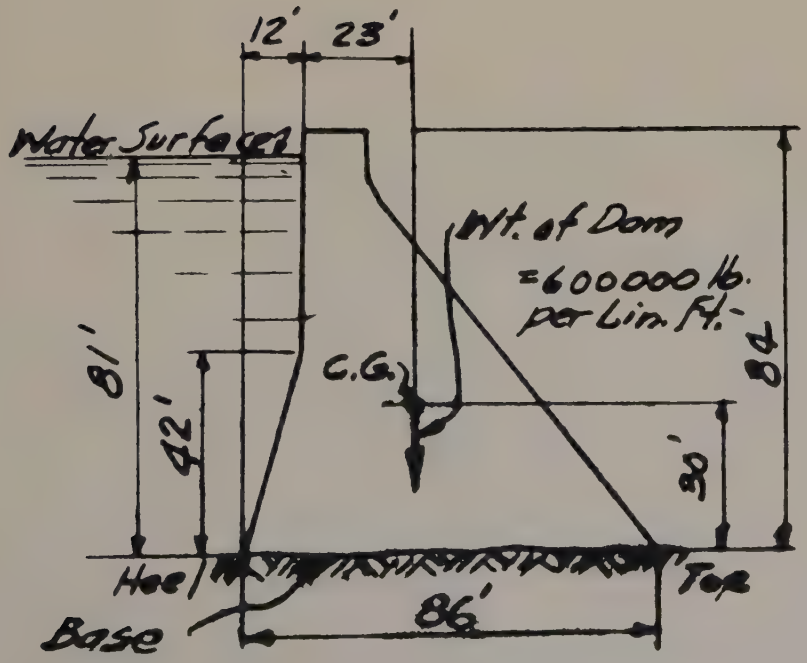
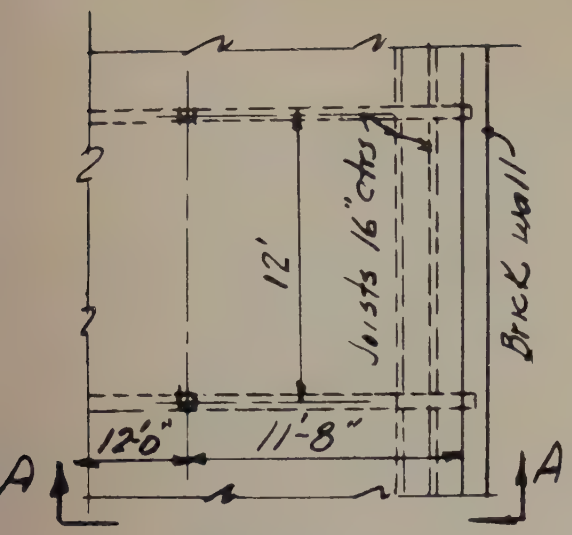
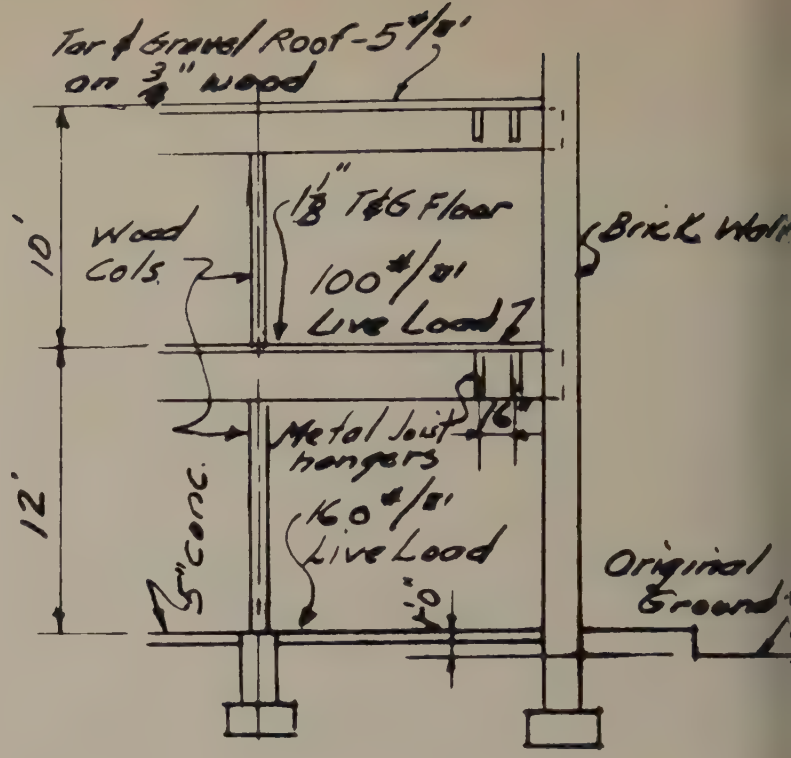


FIG D-24



PLAN

12'x12' Bays



SECT. A-A

FIG D-25

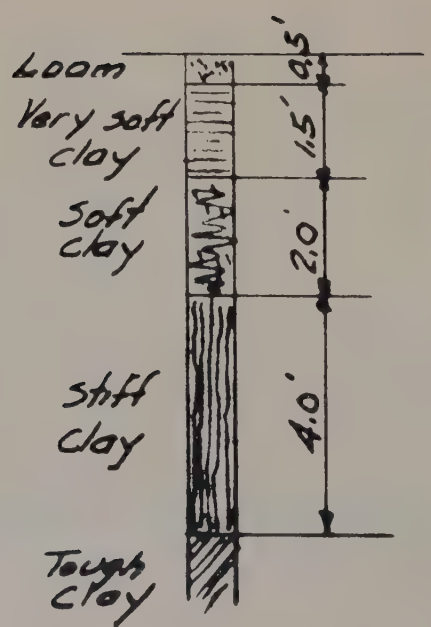


FIG D-26

Technicians

(continued from page 8)

about legislation in each of the states to provide for legal registration such as is required of engineers, medical doctors, nurses, etc. Instead, a **Certification** procedure appeared to be the logical solution. The Certification procedure should (a) provide means of recognizing individual competence, so that a technician who attains a certain level of performance could be recognized outside of his immediate work unit; (b) provide an incentive for technical improvement, so that job advancement could be better justified and rewarded.

Certification procedures have been set up successfully in the medical profession, with both the X-Ray Technicians and Medical Technologist, and in business with the Certified Professional Secretaries. After studying their operations, it appeared quite feasible to establish a Certification procedure for engineering technicians.

Serious discussion revealed that the interests of the technician would not be served best by having them enter NSPE in a special class of membership. It was agreed that the interest of all would be served best if the technicians themselves could organize their own society. It is felt that this will occur as a natural consequence of the Certification procedure.

Upon recommendation of the ETC, the NSPE Board authorized the establishment of an Institute for the Certification of Engineering Technicians. Complete details regarding the operation of the Institute are now being worked out. Although complete details have not been finalized, current thinking envisions the Institute as consisting of a Board of Trustees, plus a Dean or Executive Secretary. The Board will consist of equal numbers of professional engineers and Senior Engineering Technicians (top grade of Engineering Technicians). It has been suggested that the Board of Trustees be composed of four of each of these; and the representation will be so chosen to provide a wide range of the engineering fields of industry, teaching, consulting practice, and government.

The Institute should make provision for recognizing three grades of technicians: (1) Engineering Technician Trainee (ETT); (2) Engineering Technician (ET); and (3) Senior Engineering Technician (SET). Figure 1 shows the relationship between these grades. It will be noted that advancement in grade always requires the endorsement of a professional engineer or equivalent. In addition, an Engineering Technician Trainee must pass an examination before he can become an Engineering Technician.

It should be emphasized that this Engineering Technician Progression Chart does not serve as a stepping stone to the professional engineering examination procedure. It is not the consensus that a technician is a sub-engineer, or that any certain number of years' experience as a technician thereby qualifies a technician to become an engineer. At the same time, every state registration procedure makes it possible for anyone who has the required technicial knowledge and work experience to apply for the professional engineering examinations. Thus, it is possible that a person who is a technician can, by meeting the PE registration requirements of his state, step over to an entirely different ladder of progression as a professional engineer. The important point here, however, is that one does not necessarily lead to the other.

Once the Institute has been started, it would be self supporting from the fees charged for the examination procedure and Certifications. The Institute will examine the credentials of applicants and prepare and correct all examinations centrally, so that meaningful control will be maintained. The examinations will probably be administered through local professional engineering society branches or other technical socities.

The purpose of the Institute can perhaps best be stated by quoting from an initial draft of the Articles of Organization of the Institute: (a) To encourage the study of, and through appropriate activities enhance, the status of engineering technicians; (b) to elevate the performance standards of engineering technicians by improving their training (this could be done in cooperation with existing organizations such as ECPD, ASEE, etc.); (c) to determine the competence of engineering technicians and to arrange and conduct investigations and examinations to test the qualifications of voluntary candidates for certificates to be issued by the Institute . . . ; (d) to grant and issue certificates to engineering technicians who voluntarily apply therefor, and maintain a registry of holders of such certificates; (e) to do and perform all things necessary or incidental to the foregoing specific purposes.

All of the recommendations of the ETC have been accepted by the Board of Directors of the NSPE, and the National Society is advancing the money for the first year's operations of the Institute until it can become self supporting.

This project of the NSPE to make possible the improved status and prestige of engineering technicians is an ambitious project which may affect, profoundly, the technological development of our country. It is the firm belief of the NSPE that the Institute and its Certification procedure will fill a real need and that it should succeed. It is recognized, however, that it is human nature to oppose what we do not understand. Thus, it is felt that the entire NSPE membership should be made thoroughly acquainted with this project, and it is the purpose of this article to so acquaint the members. Other articles have appeared in the **American**

ngineer and in the periodicals of the various other ate societies. Likewise, chapter activity programs re being developed to present the information regard- ng the Institute on the local level. Also, steps are eing taken to obtain full cooperation from the tech- ical societies, industry, and educational institutions.

Every registered professional engineer has an op- ortunity to help in the success of the Institute. You an help by urging qualified technicians to apply for Certification, and by writing meaningful endorsements so that high standards to Certification may prevail. As the Institute grows and its Certification procedure becomes well known and meaningful, the technicians in the engineering field will be provided with their well-deserved recognition; the engineering team will thereby benefit, and the individual engineers may find that they are working in a more harmonious atmosphere than would otherwise be possible.

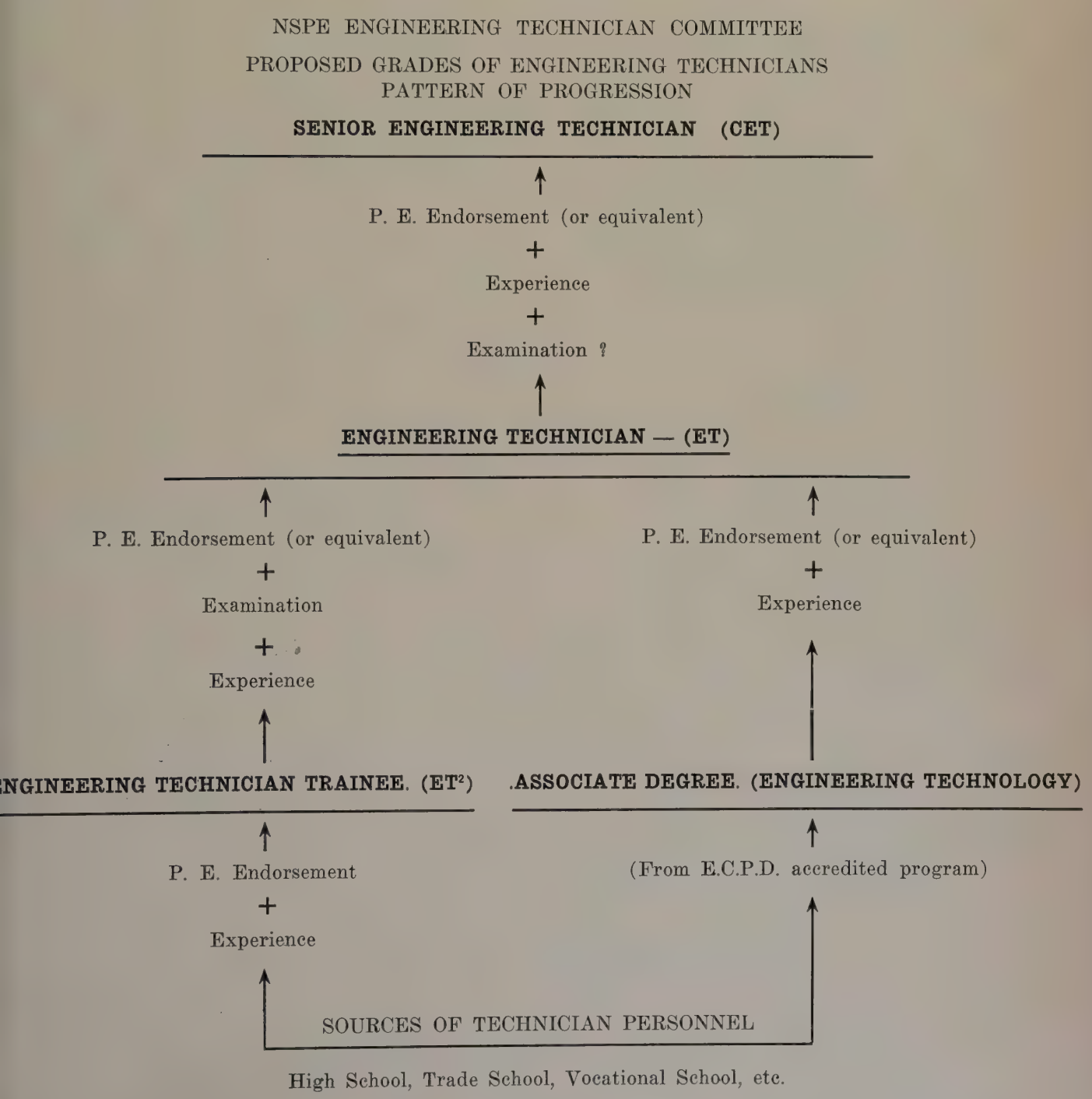


FIGURE 1 Revised 12-60

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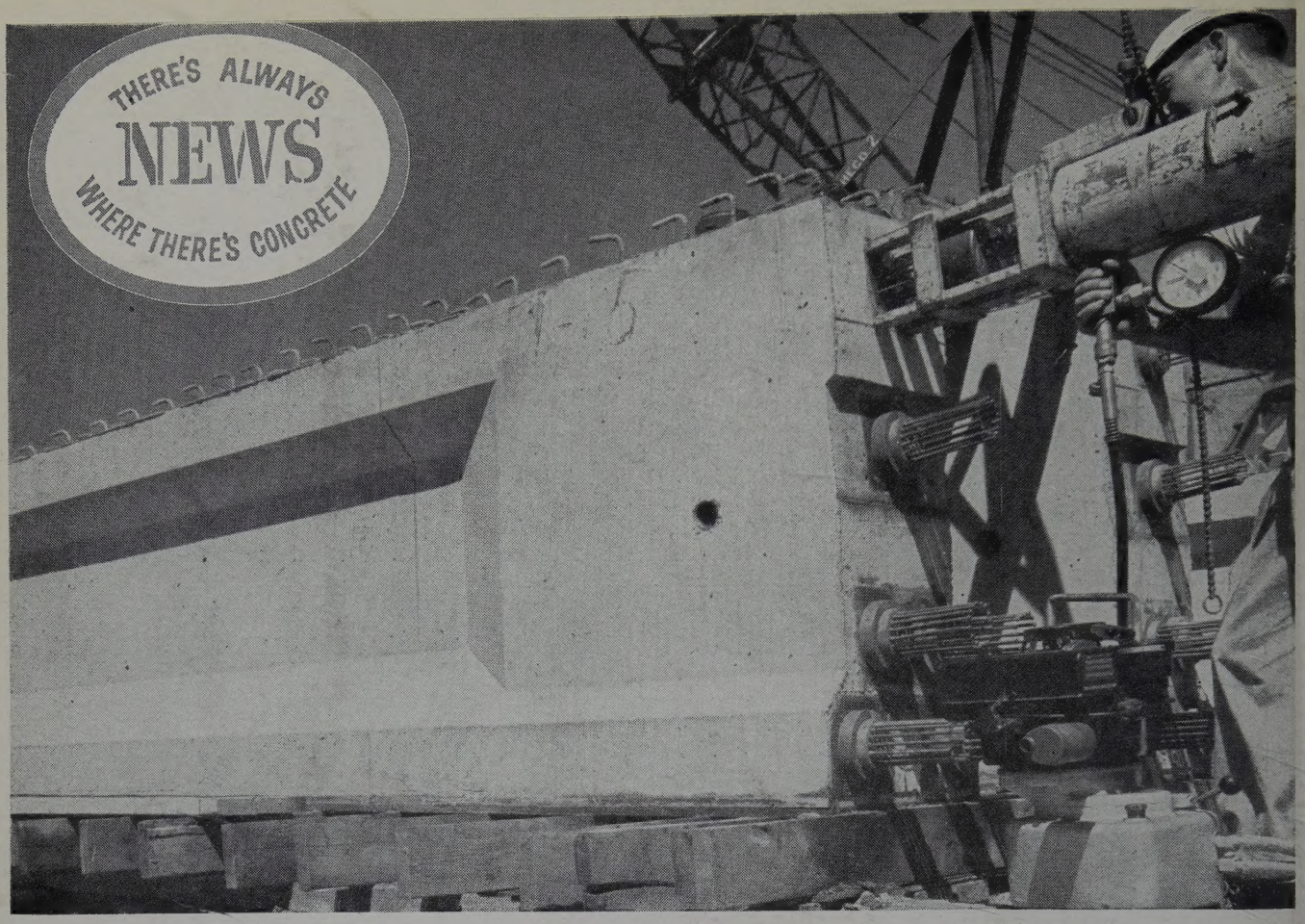

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Prestressing has already been proved in the building of thousands of bridges and commercial and industrial structures. Dams, circular tanks and pressure pipe have also benefited from the economy it brings.

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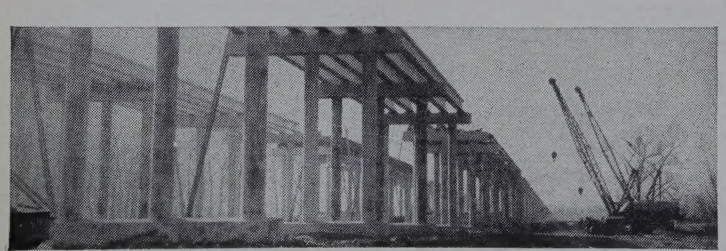

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